

# RAILWAY RATES

THE METHOD OF CALCULATING EQUITABLE RATES  
AND CHARGES FOR MERCHANDISE  
CARRIED ON RAILWAYS

IN THREE PARTS

BY THE LATE  
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## PREFACE

JOSEPH HORROCKS, the author of "The Method of Calculating Equitable Rates and Charges for Merchandise Carried on Railways," having spent a great portion of his life in the study of railway rates, and the management of goods traffic on railways, became an acknowledged expert in these matters.

The volume, which we, his nieces and executrices, now place before you, in accordance with his dying request, is the result of the above-mentioned experience and many years of patient labour

If the "Method" prove to be of use to the authorities who are seeking to reform the present system, the object of a noble life will be fulfilled. If not, we shall have carried out the author's verbally expressed wish by publishing the work, and shall be thankful that our beloved uncle has not lived to suffer the disappointment of failure

Thanking you for your forbearance, we are

Yours faithfully,

PRISCILLA BLACKMORE KNOWLES,  
BESSIE KNOWLES.



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# RAILWAY RATES

## PART I

### DEFINITIONS OF SERVICES, LIABILITIES AND OBLIGATIONS

THE act of conveying a train consisting of engine, tender, brake-van, and loaded or empty wagons from one station on a railway to another station, respectively called the first and second terminal stations, comprehends three interterminal services, namely, railage, haulage, and truckage.

*Interterminal railage*—The interterminal service of railage consists in the continuous use of a section of railway by a train in its progress from the first to the second terminal station. It includes the employment of signalmen, aided by machinery, to safeguard the movements of the train during its journey. The track immediately in front of a train in motion must, for reasons of safety, be kept clear, hence a moving train monopolizes a section of railway many times greater than its own length.

*Interterminal haulage*—The interterminal service of haulage comprises the expenditure of power, the use of machinery, and the employment of a staff of skilled men in moving a train and controlling its course from the first to the second terminal station.

*Interterminal truckage*—The interterminal service of truckage consists in the use of vehicles forming a train during their transit from the first to the second terminal station. The use of tarpaulins, chains, ropes, and other accessories must be joined to that of wagons, all these instruments being applied to analogous purposes.

Every act of conveyance is preceded and followed by the performance of certain services at each terminal station. These services are similar at both first and second terminal stations. They are six in number, and may be described as follows—stoppage, railage, haulage, truckage, portorage, and clerkage.

*Terminal stoppage*.—The terminal service of stoppage denotes the combined services of railage, haulage, and truckage rendered during the stay of an engine or train at a terminal station for the purpose of attaching and detaching loaded or empty wagons.

The interterminal services of railage, haulage, and truckage, constituting conveyance, and the first and second terminal services of stoppage which form the complement of conveyance, are judged, for calculative purposes, to take place continuously, alternating thus. stoppage, conveyance, stoppage. The passage of a train, however, between the terminal stations is often interrupted owing to a variety of causes, such as obstacles in the way, need of fuel or water, the approach from behind of a quicker train which necessitates the shunting of a slower train in front, and other reasons. During these interruptions the services of railage, haulage, and truckage continue to be performed.

Other services, distinct from those forming conveyance and yet indispensable, have to be fulfilled daily. For example, before a locomotive can be used as an instrument of power it has to be got in readiness for the work set before it, and individuals are employed to do this duty. The driver, fireman, and guard have their several duties to perform, daily, before they are able to place an engine, tender, and brake-van in position for attaching wagons to form a train. When a journey outward is completed, preparation has to be made for the journey inward. To conclude the day's work, the locomotive needs to be taken to the engine-shed to be cleaned before being again used. The work accomplished by means of the railway, steam power, machinery, vehicles, and labour, in effecting the complete conveyance of trains, comprises duties that may be divided into two kinds, and distinguished as main services and suppletive services. Probably only seven or eight out of every ten hours of employment are devoted by the staff of a train to the performance of main services, or services that can be professedly charged for.

Services rendered under other circumstances are also to be noted. On certain sections of railway where the gradient is steep, locomotives are employed to assist in the conveyance of trains from the foot to the summit of the incline, after which they return, to be again available for the same duty in connection with other trains. By this procedure, the interterminal services of railage, haulage, and truckage, relating to the instruments of power, are increased.

At some stations it frequently occurs that large consignments of merchandise, designed for one trader or firm, are tendered for conveyance, requiring the despatch of extra trains. Such trains are called special trains, to distinguish them from the ordinary daily goods trains that appear in the working time-table. When special trains have completed their journeys, it may happen that return-loads cannot be provided, and that the engines, tenders, and brake-vans have to be brought back, without trains, to the stations whence they came. In this contingency, the weight of the engine, tender, and brake-van, employed to effect the conveyance of a train, becomes doubled; the interterminal



services of railage, haulage, and truckage, relating to the instruments of power, being doubled also.

*Terminal railage.*—The terminal service of railage consists in the use, at a terminal station, of sidings as receptacles in which loaded or empty wagons may stand, and in which they may be moved or marshalled by locomotives or other power, as circumstances require. It includes the use of the adjacent main line, when necessary, in carrying out shunting operations, and the consequent employment of signalmen. It embraces the use of covered and uncovered platforms, wharfs, and other suitable places where goods, either already conveyed or intended to be conveyed, may be temporarily deposited for the railway company's convenience, and also the use of land giving access to the sidings.

*Terminal haulage.*—The terminal service of haulage comprises the expenditure of power, the use of machinery, and the employment of individuals to control the power and machinery, in moving loaded or empty wagons, at a terminal station, from one position in the sidings to another, as may be required.

Suppletive services are performed in connection with terminal haulage. The locomotives designated for shunting purposes, like those employed to haul trains, need to be prepared, periodically, in order to become effective instruments of power, and have to be moved, as required, to and from the stations where their services are performed. When horses are employed, they, too, require frequent attention to render them fit for their task. Also, the work of moving wagons at stations is often interrupted for brief periods, owing to various causes, although the expenses of labour, power, and machinery still continue.

*Terminal truckage.*—The terminal service of truckage consists in the use, at a terminal station, of wagons, including their accessories, either loaded, waiting to be despatched or discharged, or empty, waiting to be placed in position for loading or despatch, as the case may be. The use of tarpaulins in protecting damageable goods from the weather, and the use of sheds provided with the same intent during the processes of loading and unloading, must be joined to that of wagons, as instruments fulfilling analogous purposes.

The journeys of wagons between stations situated either far apart, on different branch lines, on different main lines, or on a branch and a main line respectively, cannot, with convenience, be made continuously in all cases. At junctions, and other suitable places of transfer, sidings are provided in which wagons, having finished a part of their designed journey, may be left, temporarily, and marshalled with other wagons intended to proceed in the same direction, preparatory to the next part of the journey. When wagons are conveyed to their destination by stages, and are temporarily lodged in sidings at junctions or intermediate stations, services of stoppage, railage, haulage, and truckage are rendered

at such places. It may be assumed that the larger portion of traffic is taken to its destination directly, or by a continuous process, and a smaller portion arrives there by stages.

Services rendered at intermediate places of transfer correspond with some of those performed at terminal stations, and, for distinction, may be called junctional services. Although junctional services are similar to terminal services and might be joined to them, it is requisite to calculate their cost separately, in order that suitable charges may apply to merchandise passing to and from private sidings, at which places some of the terminal services are wholly performed by traders, while the corresponding junctional services continue to be performed by the railway company.

*Junctional stoppage.*—The junctional service of stoppage denotes the combined services of railage, haulage, and truckage rendered during the stay of engines or trains at a junction or other intermediate place of transfer for the purpose of attaching and detaching loaded or empty wagons. It includes the performance of suppletive services as described in reference to the interterminal services of railage, haulage, and truckage, and the terminal service of stoppage.

*Junctional railage.*—The junctional service of railage consists in the use, at a junction or other intermediate place of transfer, of sidings as receptacles in which loaded or empty wagons may stand, and in which they may be moved or marshalled by locomotives or other power as circumstances require. It includes the use of the adjacent main line, when necessary, in carrying out shunting operations, and the consequent employment of signalmen.

*Junctional haulage.*—The junctional service of haulage comprises the expenditure of power, the use of machinery, and the employment of individuals to control the power and machinery, in moving loaded or empty wagons at a junction or other intermediate place of transfer, from one position in the sidings to another, as may be required. It includes the performance of suppletive services, as described in connection with terminal haulage.

*Junctional truckage.*—The junctional service of truckage consists in the use of loaded or empty wagons, with their accessories, during their stay in the sidings at a junction or other intermediate place of transfer.

In relation to short railways, or such as have no branches, there will, of course, be no occasion to compute charges for junctional services, since the services will not be performed.

When merchandise is conveyed by two or more railway companies conjointly, and wagons, loaded or empty, are transferred by one railway company to another railway company at appointed junctions, such junctions may be called interjunctions to distinguish them from junctions

that unite branch lines with main lines, or with other branch lines on the same railway.

*Interjunctional stoppage*.—The interjunctional service of stoppage signifies the combined services of railage, haulage, and truckage rendered at an interjunction during the stay of the engines or trains of one railway company for the purpose of detaching or attaching wagons, loaded or empty, prior or subsequent to their conveyance by another railway company. It includes the performance of suppletive services, as described in reference to the interterminal services of railage, haulage, and truckage, and the terminal service of stoppage.

*Interjunctional railage*.—The interjunctional service of railage consists in the use, at an interjunction, of sidings as receptacles in which loaded or empty wagons may stand, after having been conveyed by one railway company and before being conveyed by another railway company, and in which they may be moved or marshalled by locomotives or other power, as circumstances require. It includes the use of the adjacent main line, when necessary, in carrying out shunting operations, and the consequent employment of signalmen.

*Interjunctional haulage*.—The interjunctional service of haulage comprises the expenditure of power, the use of machinery, and the employment of individuals to control the power and machinery, in moving, at an interjunction, loaded or empty wagons, after having been conveyed by one railway company and before being conveyed by another railway company, from one position in the sidings to another, as may be required. It includes the performance of suppletive services, as described in connection with terminal haulage.

*Interjunctional truckage*.—The interjunctional service of truckage consists in the use of wagons, loaded or empty, with their accessories, during their stay in the sidings at an interjunction, after having been conveyed by one railway company and before being conveyed by another railway company.

Interjunctional services are, of course, performed only when wagons, loaded or empty, are transferred by one railway company to another railway company. When three or more railway companies are jointly employed to convey merchandise, wagons, loaded or empty, are usually transferred by one railway company to another railway company at successive interjunctions, services of stoppage, railage, haulage, and truckage being fulfilled at each interjunction.

*Porterage*.—The service of porterage consists in the employment of labour, and, when required, includes the use of machinery and power, at a terminal station, in loading, unloading, covering, and uncovering railway vehicles, and in assisting to load and unload carts, wagons, and other road vehicles appointed to convey goods between the station and traders' places of business. It also includes the sorting of goods that

is frequently necessary between the operations of unloading and loading.

*Clerkage*—The service of clerkage consists in the employment of writers, accountants, cashiers, auditors, and others, at a terminal station, to discharge the numerous duties that pertain to book-keeping; and embraces a share of the clerical work performed at the general or principal offices of the railway company. It also includes the consumption of stationery and the provision of offices and needful furniture. The duty of weighing goods for the railway company's purposes may, with convenience, be joined to the service of clerkage.

It is often found expedient to use one wagon for small consignments of goods intended to be conveyed to various stations lying in one direction, and to despatch it to some large station situated either on the way to, or in the neighbourhood of, such stations. On arrival, the wagon is unloaded and the small consignments are severally re-stowed in different wagons with other goods designed for the same stations, and sent to their respective destinations. This process is called transshipment, the object of it being to economize the use of vehicles. The handling of goods that are transhipped at a station forms an additional service of portorage. Also each transshipment involves the performance of extra clerical duties, mention of each consignment having to be made in an invoice describing the contents of a wagon forwarded *to* a transshipping station, and again, in another invoice, when forwarded *from* a transshipping station.

It is unadvisable to establish separate charges for the services of portorage and clerkage performed in the manner described with regard to goods that are transhipped, but the cost of their fulfilment should be included in computing charges for the terminal services of portorage and clerkage.

Labour of all kinds, employed, with means and appliances, in the business of railway transport, has its immediate overseers as well as superintendents more distantly located. All the operations are assumed to take place under the control of the directors and the general manager of the railway. A superintendent has charge of each division of labour or each service, though two or more divisions may be supervised by the same individual. When a railway is of great length it is divided into districts, and assistant superintendents are appointed, who, under the control of their respective chiefs, discharge the duties assigned to them. Superintendents, whether chief or assistant, usually have a staff of clerks respectively. At each goods station a manager is appointed to conduct the local business, and the staff at the station and the proceedings that take place there are in his care. Thus, in addition to foremen and inspectors in close proximity to the operations which they control, there are other individuals, culminating with the directors, who are invested with supervisory powers.

When a railway company makes its own locomotives, vehicles, and other instruments pertaining to its business, land is obtained, buildings are constructed, machinery is provided, raw and other materials are purchased, and artisans are employed for the purpose of producing the articles required. Repairs are executed by the same staff of workmen. The work of repairing and renewing railway-carriers' machinery is accomplished under overseers extending from foremen to the board of directors, as in the operations constituting railway transport.

In calculating charges for any service, the cost of skilled or unskilled labour and of its superintendence, whether directly or indirectly performed, must be taken into account.

The force invisibly and continually operating between all substances, drawing and holding them closely together, gives stability to the earth and renders it a fulcrum in every kind of locomotion that takes place on its surface. The exertion of this force, considered in relation to any substance when resting on another substance, creates pressure, which, when measured, is termed the weight of that substance.

The computation of weight, time, and distance is rendered possible by the invention of means to define extent, each attribute having its own form of measure. In this country weight is measured and expressed by tons, cwts, qrs., and lbs., time, by hours and minutes, and distance, by miles.

*Conveyance*—The weight of a train or its measured pressure upon the rails, and the time occupied in transit, determine the extent of the inter-terminal services of railage, haulage, and truckage coincidentally fulfilled in each act of conveyance. To facilitate calculation it is found convenient to substitute distance for time, although the latter is the true criterion in estimating the extent of services rendered during a journey.

*Terminal stoppage*—When trains are appointed to run between two stations only, wagons forming a load are attached at the first terminal station and detached at the second terminal station. The journey is then completed, the wagons transferred at each stop forming the train-load. When, in the course of a journey, trains are timed to stop at many stations to attach and detach wagons, only a part of the train-load is transferred at each stop, although services relating to the whole train-load are rendered during the period of transfer. At each stop the momentum of the train is lost and has to be regained. A section of the main line continues to be used by that portion of the train unaffected by the operation until the work of transferring the other portion is accomplished, the attention of the signalmen in charge of the section being continuously engaged. The deterioration of vehicles is appreciably increased during the time when they are brought to a stand from a state of motion, and also when the movement is resumed, the sudden application of the brake and the power causing concussion and strain respectively.

The services of railage and truckage, relating to the whole of a train, are rendered during the period occupied in transferring any part of it. With regard to haulage, all the duties constituting the service are performed during the period of stoppage, but there is some diminution in the expenditure of power as compared with that occurring during an equal period of conveyance, resulting in the saving of fuel and water. This saving is probably counterbalanced by the expenditure of power needed to recover full speed after each stop. The extent of the services of railage, haulage, and truckage, combining to form a terminal service of stoppage, is determined by the weight of the whole train and the time occupied in effecting the transfer of wagons—whether the transfer be that of the train-load or only a part of it—and may be assumed to be equivalent to that of the corresponding services rendered in the conveyance of the whole train during an equal period of time.

*Terminal railage.*—The service of railage is rendered in relation to wagons, loaded or empty, that stand, or are moved from place to place, at a terminal station. The extent of the service, with reference to each wagon, is determined by its weight loaded and its weight empty, and the period of time during which it remains, alternately loaded and empty, at the station.

*Terminal haulage.*—During the greater part of the time that wagons remain at terminal stations they are at rest. It is only at intervals that their position requires to be altered, the movement being usually effected by means of steam, horse, hydraulic, or gravitative power. The facilities afforded for shunting are not alike at all stations, the main line having often to be used at places where the provision of sidings is inadequate for the purpose. By far the largest portion of the service of terminal haulage is performed by the agency of locomotives and their accessories, whose use necessarily involves, in relation to themselves, the services of railage and truckage as well as that of haulage, the three services being rendered coincidently. For the sake of simplicity of calculation, the three services, *railage*, *haulage*, and *trucking*, rendered in relation to *locomotives* employed in shunting, and the service of *haulage* performed in relation to *wagons*, may be joined together under the appellation of terminal haulage. The extent of the service, in reference to each wagon, is determined by its weight loaded and its weight empty, and the period of time during which it is moved, alternately loaded and empty, at a terminal station.

*Terminal truckage.*—The service of truckage is rendered in relation to wagons, loaded or empty, that stand, or are moved from place to place, at a terminal station. The extent of the service, with reference to each wagon, including its accessories, is determined by its weight loaded and its weight empty, and the period of time during which it remains, alternately loaded and empty, at the station.

*Junctional stoppage*—Junctions are often contiguous to stations. Consequently, wagons, transferred at such places and at intermediate stations, frequently consist of vehicles beginning or ending a journey and vehicles beginning or ending one stage of a journey; or they may be wholly of one description or wholly of the other. In view of the identity of the two services and the frequency of their associated performance, the measure of one service may be fittingly expressed in the same terms as that of the other; and the explanatory remarks concerning terminal stoppage will also apply to junctional stoppage. Therefore, adopting the words used with reference to the terminal service of stoppage, the extent of the services of railage, haulage, and truckage, combining to form a junctional service of stoppage, is determined by the weight of the whole train, and the time occupied in effecting the transfer of wagons—whether the transfer be that of the train-load or only a part of it—and may be assumed to be equivalent to that of the corresponding services rendered in the conveyance of the whole train during an equal period of time

It is important to note that junctional stoppage, like terminal stoppage, is a twofold service. The stoppage of a train to detach wagons at the end of a stage involves the stoppage of a succeeding engine or train to attach the same wagons before beginning the next stage of the journey. Long journeys are often divided into three or more stages for the sake of economy and convenience.

*Junctional railage*—The service of railage is rendered in relation to wagons, loaded or empty, that stand, or are moved from place to place, in the sidings at a junction or other place of transfer. The extent of the service, with reference to each wagon, is determined by its weight loaded or its weight empty, and the period of time during which it remains, awaiting removal, in the sidings at the place of transfer.

*Junctional haulage*—During the greater part of the time that wagons, loaded or empty, remain in the sidings at junctions or other places of transfer, they are at rest. It is only at intervals that their position requires to be altered, the movement being effected by means of steam or other power. The use of locomotives and their accessories, for shunting purposes, necessarily involves, in relation to themselves, the services of railage and truckage as well as that of haulage, the three services being rendered concurrently. To simplify calculation, the services of railage, haulage, and truckage rendered in relation to locomotives so employed, and the service of haulage performed in relation to wagons in the sidings at a junction or other place of transfer, may be joined together under the name of junctional haulage, as in the case of terminal haulage, and include the performance of suppletive services, as described in connection with the latter service. The extent of the junctional service of haulage, with reference to each wagon, is

determined by its weight loaded or its weight empty, and the period of time during which it is moved in the sidings at the place of transfer.

*Junctional truckage.*—The service of truckage is rendered in relation to wagons, loaded or empty, that stand, or are moved from place to place, in the sidings at a junction or other place of transfer. The extent of the service, with reference to each wagon, including its accessories, is determined by its weight loaded or its weight empty, and the period of time during which it remains, awaiting removal, in the sidings at the place of transfer.

When two or more railway companies are employed, conjointly, in the conveyance of merchandise, and loaded or empty wagons are transferred at an interjunction by one railway company to another railway company, the interjunctional services of stoppage, railage, haulage, and truckage are performed

*Interjunctional stoppage.*—Interjunctions are often in proximity to stations. Consequently, wagons, transferred at such places, frequently consist of vehicles that are intended to be conveyed, or which have already been conveyed, by another railway company, and vehicles that are sent, expressly, to or from such stations, or they may be wholly of one description or wholly of the other. In view of the identity of the two services and the frequency of their associated performance, the measure of one service may be fittingly expressed in the same terms as that of the other; and the explanatory remarks concerning terminal stoppage will also apply to interjunctional stoppage. Therefore, adopting the words used with reference to the terminal service of stoppage, the extent of the services of railage, haulage, and truckage, combining to form an interjunctional service of stoppage, is determined by the weight of the whole train and the time occupied in effecting the transfer of wagons—whether the transfer be that of the train-load or only a part of it—and may be assumed to be equivalent to that of the corresponding services rendered in the conveyance of the whole train during an equal period of time.

Interjunctional stoppage, like terminal and junctional stoppage, is a twofold service. The stoppage of a train on one railway to detach wagons at an interjunction, after completing one part of a journey, is followed by the stoppage of an engine or train on another railway to attach the same wagons, before beginning the next part of the journey.

*Interjunctional railage.*—The service of railage is rendered in relation to wagons, loaded or empty, that stand, or are moved from place to place, in the sidings at an interjunction. The extent of the service, with reference to each wagon, is determined by its weight loaded or its weight empty, and the period of time during which it remains, awaiting removal, in the sidings at an interjunction.



*Interjuncional haulage.*—During the greater part of the time that wagons, loaded or empty, remain in the sidings at interjunctions, they are at rest. It is only at intervals that their position requires to be altered, the movement being effected by means of steam or other power. The use of locomotives and their accessories, for shunting purposes, necessarily involves, in relation to themselves, the services of railage and truckage as well as that of haulage, the three services being rendered concurrently. To simplify calculation, the services of railage, haulage, and truckage fulfilled in relation to locomotives so employed, and the service of haulage performed in reference to wagons in the sidings at an interjunction, may be joined together under the name of interjuncional haulage, as in the case of terminal haulage, and include the performance of suppletive services, as described in connection with the latter service. The extent of the interjuncional service of haulage, with reference to each wagon, is determined by its weight loaded or its weight empty, and the period of time during which it is moved in the sidings at an interjunction.

*Interjuncional truckage.*—The service of truckage is rendered in relation to wagons, loaded or empty, that stand, or are moved from place to place, in the sidings at an interjunction. The extent of the service, with reference to each wagon, including its accessories, is determined by its weight loaded or its weight empty, and the period of time during which it remains, awaiting removal, in the sidings at an interjunction.

*Porterage.*—The service of handling and lifting goods, in the process of loading and unloading railway wagons and road vehicles, is influenced by the nature, size, and shape of the article or articles handled as well as by the weight, and is, therefore, somewhat variable in extent. Small packages of goods, consigned to different individuals, require to be sorted between the acts of unloading and loading, having regard to road vehicles and railway vehicles respectively, which adds to the work of handling. Between the loading or unloading of one railway wagon and the loading or unloading of another railway wagon, by a staff of porters, there is an interval of time which is greater or less according to the circumstances in each case. Sometimes the wagons to be operated on, consecutively, are some distance apart, at other times, near together. There is always some little preparation needed before a wagon is loaded or unloaded, and some slight service required at the end of the operation. For these reasons, small loads of one description of merchandise occasion a greater service of porterage per ton than larger loads of the same kind of merchandise. To meet these conditions, which are constantly present in the operations of loading and unloading vehicles at terminal stations, it is expedient to make use of the weight of the wagon as well as that of the load which it carries in estimating the extent of the service of

portage At first sight it may appear inappropriate to associate the weight of the wagon with that of the load in valuing the service of portage, but careful consideration will show that it furnishes a means for measuring the service so as to accord with the attendant conditions. Presuming that this mode of measurement will answer the purpose, it may be stated that the extent of the service of portage is determinable by the weight of the load, and by the agency of that of the wagon in which it is carried.

*Clerkage.*—When a trader sends goods by railway to another trader, it is customary for the sender to write, on what is called a consignment note, the name and address of the consignee, a description of the goods, or the number, kind, and distinguishing marks of the articles sent; the weight, an intimation whether the charge for carriage will be paid by the consignor or the consignee; the name of the sender; and any other information that may be relevant. The consignment note is delivered to the railway company along with the goods to which it relates. The railway company's representative must then satisfy himself, as far as possible, that the goods correspond, in all respects, with the particulars entered on the note, and, when an article is addressed, that the address is in agreement also. A consignment note may contain the names of one or more consignees, with their addresses, and the number, description, marks, weight, etc., of the articles respectively consigned to them. The duty of the railway company is to forward each consignment of merchandise to its destination, and to transmit to the receiving station, in the form of an invoice, the particulars given on the consignment note, adding the number of the wagon containing the goods, the rate per ton inclusive of terminal and other charges, and the total amount paid for carriage by the consignor or to be paid by the consignee, as the case may be. When small consignments of goods, having different consignors and consignees—the latter being located in the same town—are forwarded to a station in the same wagon, the particulars may be entered together in one invoice, the total weight and amounts paid and to pay for carriage (separate columns being provided for the purpose) being written at the foot. When merchandise, forming a single consignment and occupying one or more wagons, is sent at one time to a station for one consignee, one invoice is sufficient to convey the customary information. Press copies of the invoices issued are retained at the forwarding or first terminal station, and the original invoices are kept at the receiving or second terminal station. The record of the traffic passing between any two stations, therefore, is identical at each station, and the returns sent from each of the two stations for any period, so far as they relate to that traffic, should be identical also, any difference indicating error. The particulars entered in the invoices form the basis for much of the service of clerkage.

The numbers of loaded wagons arriving at, and departing from, any station, are entered in the wagon-book at the station, together with the names of the stations from or to which the vehicles are labelled, and they are also given in the invoices, but, usually, no further account is kept. When empty wagons are forwarded from stations they are not invoiced. Their numbers are usually entered in the wagon-books at the forwarding and receiving stations, as in the case of loaded wagons, but, generally speaking, no further record is kept of their movements. The journeys of wagons themselves, whether loaded or empty, and the duration of their stay at the terminal stations and at other places, are as much matters for the calculation of cost as when relating to the contents of wagons. It is essential with regard to wagons that their weights, the names of the stations between which they travel, the distances travelled, and the periods of time during which they remain at the terminal stations, and at junctions and other places of transfer, should be carefully recorded in each case, and form a part of the periodical returns equally with information pertaining to merchandise.

The service of clerkage cannot be said to have a fixed relation to the weight of the goods invoiced or to that of the wagon in which the goods are carried. Nevertheless, assuming that loads, wagons carrying loads, and empty wagons conveyed are to form, equally, the subject of clerkage, the weights of consignments joined, respectively, with the weights of wagons in which they are carried, including, in each case, a proportionate part of the weight of empty wagons conveyed, furnish a suitable means for apportioning the service.

Certain liabilities and obligations are attached to the business of railway carriers.

*Risk.*—A railway company is liable to suffer loss through injuries to individuals, damage to permanent way, rolling-stock, and merchandise, caused by collisions, derailments, and other accidents that happen during the progress of operations. Such occurrences may be due to causes beyond human control, or to faults of individuals. Claims have also to be paid for loss of goods by leakage, theft, etc., and for damage done by moisture, friction, breakage, etc.—incidents that take place during the ordinary course of business. Faulty loading of wagons and unheedful handling of goods are frequently the cause of loss and damage. All such events may be expected but cannot be foreseen, and the consequent exposure to loss constitutes risk. The sums annually paid by railway companies on account of damage to, and loss of, merchandise, added to the cost of repairing damage to rolling-stock and permanent way, arising from accidents and other causes, form a guide in making provision for risk.

To cover risk in the process of conveyance and in the operations at terminal stations, junctions, and other places of transfer, sums must be

employed as factors with the weights of loads and wagons, respectively, to compute fixed charges, irrespective of time or distance. The amount produced by this means should be sufficient to indemnify railway companies against loss resulting from accidents and other causes.

In carrying highly valuable or dangerous merchandise, the risk is greater than in carrying ordinary kinds of merchandise. If it be found necessary to separate articles of merchandise, pertaining to the same division of traffic, into two or more subdivisions according to the degree of risk attendant on their conveyance, the calculation of different charges for risk, applicable to each subdivision, will be required.

*Extraneous services.*—Sundry duties that form a part of railway business, although distinct from the service of transport, need to be performed, and may be described as extraneous services. They include legal services, as conveyancing, the adjustment of disputed matters, the conduct of cases in courts of law, procedure before Parliamentary Committees, and any other requisite duty or business that cannot conveniently be embraced under any other appellation. To provide for expenses of this kind, it is necessary to employ sums as factors with the weights of loads and wagons, respectively, to compute fixed charges, irrespective of time or distance. Charges calculated in the manner described will apply to all kinds of merchandise, impartially, and the amount obtained should be of sufficient magnitude to defray the cost of extraneous services.

*Taxes.*—A railway and its stations form assessable property, and the rates and taxes periodically levied by the ordained authorities come to a large amount. It is needful, therefore, for railway companies to employ a sum as a factor with the weights of loads, wagons, and the instruments of power, forming trains, conveyed one mile or other initial distance, so as to constitute a part of the rate for each consecutive distance. In addition, sums must be employed as factors with the weights of loads, the weights of wagons containing them, and the weights of empty wagons, respectively, in connection with the periods of time during which they remain at terminal stations, junctions, and other places of transfer. The amount realized by the procedure described should countervail the amount paid for taxes.

Inasmuch as the railway and its stations furnish the means for fulfilling the service of railage, and since their value forms the basis of assessment in the computation of taxes, it will be appropriate as well as convenient to increase, in a befitting degree, the sum employed as a factor with the weights of loads, wagons, and the instruments of power, forming trains, in computing that portion of the rates which is appropriate for the interterminal service of railage, and to increase, suitably, the sums employed as factors with the weights of loads and wagons in computing charges for the terminal, junctional, and interjunctional services of

railage, respectively, and for that part of any service of stoppage which consists in the service of railage, in order to provide the sums due for taxes.

Before proceeding to estimate the value of services, it is important to have in view the duties that need to be executed, whether in immediate or remote connection with the services to which they severally pertain, and also the liabilities and obligations imposed on railway carriers, in order that every source of expense may be taken into account.

## PART II

### THE METHOD DESCRIBED

THE amount of goods traffic dealt with day by day depends on the action of traders, and this action is influenced by the state of trade. Consignors and consignees expect merchandise to be forwarded without delay, and it is also for the railway company's interest that prompt despatch should be effected, since the detainment of goods conduces to increase the cost of services. Consequently, trains are appointed to run, every week-day, on each section of railway. Where the amount of traffic is large numerous trains run daily, where it is not so large the trains are fewer. Some are express and others are slow trains; the former timed to stop only at large stations, the latter at all stations. This arrangement procures a daily service of trains between the stations situated on any section of railway; and, when the times of running are judiciously fixed, the passage of trains from section to section takes place without much delay, so that merchandise may be conveyed from stations on one section to stations on other sections with expedition. But while this system secures regularity and frequency of despatch, the weights of the trains vary in accordance with the amount of traffic daily offered for conveyance.

Merchandise tendered for conveyance is made up of large and small consignments, in some cases furnishing full loads for wagons, and, in other instances, parts of full loads. Frequently the consignments are so large as to provide, singly, full loads for many wagons, but there are also numerous instances in which they fall short of full loads, and yet have to be placed in wagons and despatched with the customary promptness. Wagons provided to carry general merchandise differ considerably in weight and carrying power, and, when discharged at any station, have to be used, whatever may be their degree of suitability for the purpose, for the reception of loads consisting of different kinds of merchandise. A train-load may be composed of fully-loaded, short-loaded, or empty wagons, or it may consist of all three descriptions. Locomotives, as well as wagons, have different weights and powers. Train-loads vary in weight and are conveyed at various speeds. Wagons remain at stations for different periods of time, waiting to be loaded, unloaded, or despatched to other stations.

The subject is further complicated owing to other causes. The cost of a railway of considerable length, taking it section by section, is not uniform. Land costs more in towns than in country districts. Its configuration in presenting hills, valleys, level tracts, rocky or boggy ground, rivers, and other features along or across the designed course, affects the expense of construction. Moreover, a railway, such as described, has gradients and curves interplaccd with level and straight lengths.

The weather influences the cost of haulage and outdoor operations, generally; frost, snow, rain, and fog, adversely, and fine weather, favourably. Rain adds to the weight of trains by wetting the framework of vehicles, lodging in the hollows of tarpaulins used as covers, and saturating, when possible, the contents of open wagons.

For these reasons it may be conceded that it is impossible to make calculative provision, with regard to consignments of merchandise, so that expenses may apply to services in exact accordance with the existing conditions of transport in each case, whatever they chance to be.

There is, however, a method of procedure by which the inequalities attending transport may be smoothed without prejudice to the railway companies' interests, and without infringing the right of traders to fair treatment. This mode of action consists in equating the means used or employed by a railway company to perform interterminal, terminal, junctional, and interjunctional services. The averages to be obtained relate to prime cost, weights, periods of time, and other denominators of value which have an influence in determining the worth of services rendered. The procedure may be termed the Equalization of Instrumental Values. Some of the averages may be found with comparative ease, the information necessary for the calculations being already known. Others will be more difficult to obtain, inasmuch as information from continuous daily records will be needed before calculations can be made. Details of the averages required are as follows:—

MEANS USED OR EMPLOYED TO ACCOMPLISH INTERTERMINAL, TERMINAL, JUNCTIONAL, AND INTERJUNCTIONAL SERVICES	DESCRIPTION OF AVERAGES REQUIRED
LAND, MACHINERY, ETC.— <i>Prime Cost</i>	
Railway, provided with signalling apparatus, and other requirements	Average cost per mile.
Land, provided with sidings, turntables, structures, wharfs, roadways, etc, forming stations	
Land at junctions, provided with sidings	" " " "
Land at interjunctions, provided with sidings.	" " " "

Cranes, provided at stations . . . .	Average cost per crane
Tools, chains, hooks, slings, loose machinery, furniture, etc, provided at stations, and used in each division of labour.	Average cost per unit of each description of instrument
Locomotives . . . . .	Average cost per ton
Tenders . . . . .	" " "
Brake-vans . . . . .	" " "
Wagons, including vans, with accessories, as ropes, chains, etc.	" " "
Tarpaulins, used to cover wagons loaded with damageable goods.	Average cost per cover.

#### ARTICLES OF CONSUMPTION.—*Prime Cost.*

Fuel . . . . .	Average cost per ton.
Water . . . . .	Average cost per thousand gallons.
Other articles . . . . .	Average cost per unit of weight or measure.

#### HORSE-POWER — *Prime Cost.*

Power used in moving wagons at stations, junctions, and interjunctions, per animal	Average cost per hour.
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#### LABOUR.—*Wages*

Work done in each division of labour, per individual.	Average cost per hour
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#### RAILWAY.—*Deflections of Track* . . . . . Mean ascending gradient.

#### MACHINERY — *Weight, Speed, Time*

Open wagons, including accessories, used to carry merchandise in each division of traffic, discriminating according to size of wagon when needful.	Average weight per open wagon.
Tarpaulins and covers of wood (tops of vans)	Average weight per wagon-cover.
(Having regard to the number and weight of tarpaulins and covers of wood respectively, used on a railway, and the	



comparative cost and durability of each description of cover, it is assumed that the two instruments possess, unitedly, an average value which may be expressed by means of weight )

Covered wagons, whether vans or sheeted wagons, including accessories, used to carry merchandise in each division of traffic that requires to be covered in transit, discriminating according to size of wagon when needful	Average weight per covered wagon
Locomotives, tenders, and brake-vans, with supplies of fuel, water, tools, etc., employed in the haulage of trains	Average weight per locomotive, etc
Loaded or empty vehicles, forming train-loads	Average weight per train-load.
Engines or trains travelling between terminal stations	Average speed per hour.
Engines or trains stopping to attach and detach loaded or empty vehicles at terminal stations, junctions, and interjunctions.	Average time occupied per stop
Loaded or empty vehicles attached and detached during the stay of engines or trains at terminal stations, junctions, and interjunctions.	Average weight of vehicle transferred per stop.
Locomotives, tenders, and brake-vans, with supplies of fuel, water, tools, etc., employed in shunting at stations, junctions, and interjunctions.	Average weight per shunting-engine.

MACHINERY (WAGONS).—*Time at Terminal Stations.*

Time during which wagons, after being loaded, remain at terminal stations before they are marshalled and despatched.	Average period of time per wagon.
Time during which loaded wagons remain at terminal stations before their discharge is effected.	Average period of time per wagon

Time during which wagons, after discharge, remain at terminal stations before they are placed in position for reloading.	Average period of time per wagon.
Time during which wagons, after discharge, remain at terminal stations where they are not required for reloading, before they are placed in position and despatched.	
Time during which empty wagons, received from other stations, remain at terminal stations before they are placed in position for loading	

MACHINERY (WAGONS).—*Time at Junctions*

Time during which loaded or empty wagons remain at junctions or other places of transfer before they are marshalled and despatched	Average period of time per wagon.
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MACHINERY (WAGONS).—*Time at Interjunctions.*

Time during which loaded or empty wagons remain at interjunctions before they are marshalled and despatched.	Average period of time per wagon.
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The averages relating to prime cost are required in order to arrive at suitable sums, including profit, to be severally employed as factors with actual weights of loads, average weights of wagons and instruments of power, and with distances, to compute rates for interterminal services constituting conveyance, and with actual weights of loads and average weights of wagons, to compute charges for terminal, junctional, and interjunctional services, according to the average periods of time during which they are respectively performed, and also charges for other services, and for liabilities and obligations.

It is desirable to reduce the calculations to the narrowest dimensions, without, however, losing sight of any source of expense, and this may be accomplished by a right choice of methods of procedure.

Although the locomotive and its accessories are, ton for ton, a cause of expense equally with the train-load in the act of conveyance, it is advisable to calculate the cost of conveying the whole train by

means of the weight of the train-load alone, excluding the weight of the instruments of power. This may be done by increasing the sum fixed upon to apply to the weight of the whole train by a fraction equal to that expressing the ratio of the average weight of the instruments of power to the average weight of the train-load, and applying the increased sum to the weight of the train-load. Thus, if the average weight of the instruments of power be 100 tons, and that of the train-load 200 tons, the ratio will be the same as of 1 to 2, or one-half. In that case, if the sum chosen to apply to the weight of the train be increased by one-half, the cost of conveying the whole train may be calculated by means of the increased sum applied to the weight of the train-load alone. Or, if the average weight of the locomotive, etc., be 90 tons, and that of the train-load 150 tons, the ratio will be the same as of 3 to 5, or three-fifths. Hence, if the sum chosen to apply to the weight of the train be increased by three-fifths, the cost of conveying the whole train may be calculated by means of the increased sum applied to the weight of the train-load solely.

The cost of conveying empty wagons need not be calculated separately. If, in relation to any division of traffic, the ratio of the weight of empty wagons to the weight of wagons bearing loads, apart from the loads, conveyed the same distance, be known, then by increasing the weight of wagons carrying loads by a fraction equal to that denoting the ratio, the cost of conveying loaded and empty wagons may be calculated unitedly. Thus, if a wagon weighing 4 tons contain a load of general merchandise weighing 3 tons, and if it be assumed that the ratio of the weight of empty wagons to the weight of wagons loaded with general merchandise, apart from the loads, conveyed one mile, is the same as of 1 to 4, or one-fourth, then by increasing the weight of the wagon by one-fourth, or 1 ton, instead of 4 tons it will become 5 tons, and the calculation of the cost of conveyance will have reference to a load weighing 3 tons and a wagon weighing 5 tons, 1 ton of which will be a proportionate part of the weight of empty wagons conveyed.

The effect of these methods of procedure is, firstly, to confine calculations of cost, relating to conveyance, to the weights of train-loads alone, the weights of the instruments of power being eliminated; and secondly, to increase the weights of wagons carrying loads so as to include, with respect to each loaded wagon, a proportionate part of the weight of empty wagons conveyed.

When, in reference to each division of traffic, the average weight of wagon or of each size of wagon has been ascertained, and has been duly increased so as to include a proportion for the conveyance of empties, the weights of loads, as may be determined on, marked out for the wagon to carry, must be joined, individually, with the weight of wagon. From the weights of loads and wagons, in each instance, thus obtained

must be found, by arithmetical rule, the weight of wagon proportionate to one ton of load. Preparatory, therefore, to directly calculating the cost of conveying each load and wagon, the total amount being chargeable for the conveyance of the load, it will be convenient to calculate the cost of conveying a defined part of the load, expressed by the weight, one ton, and a part of the wagon proportionate thereto, expressed also by weight. The cost, joined to taxes and profit, of conveying these proportionate parts then becomes a rate, and is chargeable for one ton of load, which may be called the unit-weight of load. By means of rates per ton of load, calculated in this manner, the total amounts for the conveyance of loads may be expeditiously and correctly calculated.

For the purpose of elucidation, let it be supposed that a wagon weighing 4 tons contains a load weighing 5 tons. Let it be assumed that it is necessary to increase the weight of the wagon by one-fourth, or 1 ton, to provide for the conveyance of a proportionate part of empty wagons. The weight of the wagon then becomes 5 tons, the same as that of the load, the weight of wagon proportionate to the unit-weight of load being 1 ton. Let it be supposed that, for conveying the load and wagon in question a certain distance, the cost or rate, per ton of load and wagon combined, is 2*s.* 6*d.*, yielding the amount of 25*s.* chargeable for 10 tons. If computed so as to apply to the unit-weight of load alone, the rate becomes 5*s.*, which, applied to 5 tons, the weight of the load, also produces the amount of 25*s.* Again, let it be supposed that the same wagon is conveyed the same distance, but bearing a load of 1 ton instead of 5 tons. The cost or rate, per ton of load and wagon combined, will still be the same, namely, 2*s.* 6*d.*, but will apply to 6 tons instead of 10 tons, the amount chargeable being 15*s.* instead of 25*s.* In this instance the weight of wagon proportionate to the unit-weight of load is 5 tons, and the rate, per unit-weight of load, will, of course, be the same as the amount chargeable, namely, 15*s.* Under the conditions supposed, the amount chargeable for conveying a load weighing 1 ton is three-fifths of the amount chargeable for conveying a load weighing 5 tons, but the rate, per unit-weight of load, is three times greater.

Beginning with the weight of load which a wagon of average weight is registered to carry, there are many loads of less weight which the wagon may separately carry, the weight of wagon proportionate to unit-weight of load being, of course, different in each case, and requiring the calculation of a different rate per ton of load. Also, rates have to be calculated for separate divisions of traffic, and the average weight of wagon and the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed the same distance, will not be alike for each division. Since the respective relative magnitudes of the weights of loads and wagons must be very numerous, it will be

difficult to establish unit-weights of loads and proportionate weights of wagons, with suitable rates, exactly adapted to the conditions occurring. Yet, by employing a reasonably large number of differing weights of loads, a means of making provision for every contingency may be afforded that will gain the acceptance of railway companies and traders.

With this end in view, it is needful to prepare a Table for each division of traffic, in which may be entered, at the head of numbered columns, the weights of loads and wagons, one above the other, beginning with the greatest weight of load and ending with the least, as may be determined on, the weights of wagons remaining the same. The number of columns will depend on the degree of alteration by which the weights of loads are successively lessened. Below, in each column, must be entered the unit-weight of load and the proportionate weight of wagon, one above the other, relatively corresponding to the weights of load and wagon entered at the head of the column. By this arrangement, which reverses the one above, the proportionate weights of wagons will consecutively alter, beginning with the least weight and ending with the greatest, the weights of loads, to which they relate, remaining the same. The calculation of rates will have reference to the unit-weights of loads and the proportionate weights of wagons, each with each respectively, in connection with distances, which, placed in consecutive order, will form a part of the Table. When calculated, the rates must be suitably entered in the columns opposite the distances to which they refer, and will apply to the unit-weights of loads alone. The successive series of rates entered opposite the distances for which they are calculated must be progressively numbered, and may be described and referred to as scales of rates.

The numbered columns in each Table may be termed grades, because the weights of loads by which they are to be distinguished will mark, reading from left to right, progressive decreases, and, of course, reading from right to left, progressive increases. The extent of progression, in either direction, should be amply provided for, in order that the grades may be sufficiently numerous for the needs of all the divisions of traffic. Weights of loads that are less than full loads, and which come between the weights of loads employed to distinguish adjoining grades, must be deemed to be included in the grade to which they most nearly approach in weight, or which proves to be the most appropriate for them. Two or more weights of loads and wagons may be entered at the head of each grade so long as similarity of ratios is maintained. It will, therefore, be feasible to provide for each division of traffic by assigning thereto so many grades as may be sufficient for its requirements, and entering, at the head of each grade, appropriate weights of loads and wagons. This implies the preparation of separate Tables—each Table containing

grades that form a section of the whole number of grades to be created—adapted to the needs of the various divisions of traffic.

To compute charges for each terminal, junctional, or interjunctional service, with due regard to the time of duration when affected by it, or for any other service, or for any liability or obligation involving expenditure, it will be necessary to choose a suitable sum to be employed as a factor with the unit-weights of loads and the proportionate weights of wagons contained in each Table. When calculated, the charges must be duly entered in the columns to which they relate, and apply, as in the case of rates for conveyance, to the unit-weights of loads alone. The total charges for terminal, junctional, and interjunctional services, and for liabilities and obligations, calculated for the respective grades, must be added to the rates calculated for consecutive distances. The rates and charges thus united, forming single sums, per unit-weight of load, may be used to calculate amounts chargeable for the transport of loads whose weights respectively correspond or approximate to the weights of loads employed to distinguish the grades.

In calculating charges for some of the terminal services, the additions made to the weights of loaded wagons, in order to include a proportion for the conveyance of empties, require to be cancelled, because the services relate only to the wagons carrying the loads. To avoid altering the proportionate weights of wagons, which would be a troublesome process, the object desired may be attained by lessening the sums chosen to compute charges for such terminal services, when relating to the proportionate weights of wagons, in the same degree that would be needful to cancel the weights added on account of empties. For example, let it be assumed that the weight added for the conveyance of empty wagons is one-fourth of the weight of loaded wagons. By expressing the latter as a unit in fractions of the same denomination as the fraction added, that is to say, four-fourths, the weight then becomes five-fourths. To cancel the added weight, the weight, five-fourths, requires to be lessened by one-fifth, the first weight being four-fifths of the increased weight. In the case supposed, therefore, if the sum chosen to apply to the proportionate weights of wagons be reduced by one-fifth, or to four-fifths, the proportionate weights of wagons remaining unaltered, the result obtained will be the same that would follow if the unaltered sum applied to four-fifths of the proportionate weights of wagons. By the adoption of this mode of procedure, the calculation of charges for certain terminal services, when relating to the proportionate weights of wagons, will be simplified.

Merchandise, by reason of the nature, length, weight, shape, or other distinguishing feature of the article or articles composing it and which exercises a distinct influence on the manner or circumstances

of its conveyance, is separable into eight divisions of traffic, which may be described as follows:—

- 1 General merchandise, carried in open wagons.
- 2 General merchandise, carried in covered wagons.
- 3 Articles of extraordinary weight or dimensions, carried in wagons of peculiar construction
- 4 Articles of great length, occupying two or more wagons
- 5 Coal, lime, and analogous merchandise, carried in wagons specially built and exclusively used for each description of merchandise.
6. Various kinds of merchandise, includible in other divisions of traffic, carried in traders' wagons that would otherwise be returned, empty, to private sidings
- 7 Vehicles running on their own wheels.
8. Live-stock.

All railway wagons should be built so as to have, when fully loaded in regard to their individual powers, a margin of strength sufficient to endure the slight collisions with each other unavoidably occurring in transit and in the process of shunting

*General merchandise carried in open and in covered wagons*—General merchandise is extremely diverse in character, and, consequently, it is necessary to build wagons having high, medium, and low sides, in order that each description of merchandise, according to its nature, form, or the mode of packing it, may be stowed in a suitable vehicle. Many kinds of goods require covers to shield them from injury. Vans are constructed for the purpose of carrying such goods with safety, and tarpaulins are also provided in order that, by their means, open wagons may be converted into covered wagons when needful. General merchandise is consigned in quantities extending from small parcels to full loads, though there are kinds that are invariably forwarded in full loads, while other varieties are always consigned in small quantities. To answer to the designation of general merchandise, articles must be of reasonable weight and dimensions so as to be containable in the wagons provided, and must be stowable together in one wagon—articles of one kind with those of another kind—without detriment to each other, whenever the procedure is requisite. Articles that do not comply with these conditions cannot be included in the list of general merchandise.

Fitly to receive and carry the various kinds and quantities of general merchandise, wagons of different lengths, powers, and capacities are constructed. The weights of these wagons vary greatly, being of every degree from about four to about seven tons. To simplify the calculation of cost it is requisite to ascertain, by computation, the average weight of wagon—distinguishing between open and covered

wagons—employed to convey general merchandise. A greater average weight of wagon is employed to carry general merchandise requiring to be covered than general merchandise not requiring to be covered, which is ascribable to the weight of structure forming the cover. In every other respect the conditions of conveyance are the same. One Table may serve for both divisions of traffic, if the arrangement be found convenient, the same weights of loads, but with different weights of wagons, being made use of to distinguish the grades for each division. The initial and final grades will, of course, be different for each division.

A wagon of average weight may be assumed to have an average carrying power, and to furnish an average extent of space for the reception of a load.

It is the duty of foremen who are employed to superintend the loading of vehicles to select suitable wagons to carry the many consignments of general merchandise, diverse in kind and quantity, daily offered for conveyance; and it may be assumed that they perform the task to the best of their ability. It is, however, not possible to have, always, empty wagons on hand that individually provide power or receptive space to match the weights or dimensions of the loads furnished by the consignments, even when in quantities amounting to full loads. Consignments may be, and often are, either too small or too large for the empty wagons available. Thus a 5-ton wagon (in weight) may have to be used in place of a 4-ton wagon, or a 6-ton instead of a 5-ton wagon, or two 4-ton wagons instead of a 7-ton wagon, and so on. Inasmuch as loads accurately adapted to wagons, with regard to weight or volume, can only occasionally be obtained, it is requisite to ascertain, in relation to consignments of each kind of general merchandise—having in view its nature or the manner in which it is packed when tendered for conveyance—the greatest weight of load obtainable in practice, or the *averagely actual*, to be termed the *average*, as distinguished from the *potential* maximum weight of load.

To perform this task with some approach to accuracy it is necessary that the separate weights of consignments of goods answering to full loads, and of wagons carrying them, each with each, should be recorded during a reasonable period of time, so that needful calculations may be made. Assuming, as the result of such calculations, that three-fourths of the potential maximum weight of load represents the average maximum weight of load obtained from single consignments of all kinds of general merchandise carried in wagons of all sizes, whether measured by each wagon's carrying power or by its capacity, then three-fourths of the potential maximum weight of load that may be carried in a wagon of average weight, carrying power, and capacity,



having regard to each kind of general merchandise and the manner in which it is packed, will correspond or approximate to one of the weights of loads employed to distinguish the grades in the Table prepared for general merchandise, and, consequently, will indicate the grade suitable for full loads of such merchandise.

It is needful to point out that the grade, ascertained in the manner described and considered suitable for consignments of each kind of general merchandise that furnish full loads, must be deemed to be suitable for consignments that exceed full loads, because however large any consignment of general merchandise may be, the perfect adaptation of loads to wagons is prevented by the unavoidable diversities in their respective weights and sizes. In almost every instance the greatest loads obtainable are something less than the maximum loads which the wagons are individually qualified to carry under the most favourable circumstances. A consignment of general merchandise amounting to one and a quarter or one and a half full loads, measured with regard to a wagon of average size, will call for some discrimination on the part of the foreman-loader in choosing the wagon or wagons to receive it. One and a quarter full loads might be contained in a large-sized wagon, but one and a half full loads would probably require two wagons, and those of the smallest size should be selected whenever possible.

Provision must be made, by extending the grades, for the approximation of the weights of consignments that are less than full loads; so that when the weights of consignments of any kind of general merchandise are less than the average maximum weight of load or the weight of load distinguishing the grade appropriate for full loads of such merchandise, they will approximate to one or other of the weights of loads distinguishing succeeding grades.

Since a consignment of general merchandise whose weight forms a considerable fraction of a full load or of the calculated average maximum weight of load, as two-thirds or one-half, will, when placed in a wagon, leave a part of the stowing space unoccupied, the unoccupied portion may be utilized by the railway company for the reception of smaller consignments from other traders when circumstances permit or require it, but this procedure will not affect the grading of the consignment forming the principal part of the load. It is only occasionally that it is convenient to increase loads in this manner.

When small parcels or light consignments of goods are consigned by various traders in any town or district to separate or the same individuals or firms in different towns or districts, it is customary for the railway company to collect the parcels designed for the same place and stow them in one, two, or more wagons, according to the number of loads which the parcels provide. In many cases, however, the parcels

for one town or district form, jointly, only a small fraction of a full load, and yet it is often needful to employ a wagon solely for their conveyance. At other times it is possible to stow them along with a moderately large consignment of merchandise intended to be conveyed to the same town. In other instances small parcels are not sent direct to the towns or districts to which they are consigned, but, in conjunction with other goods, to some town on the way to, or in the neighbourhood of, their destinations, where they are transhipped and reforwarded along with other parcels. By the latter procedure one wagon is made to serve instead of two, but extra time is required to convey the goods to the appointed stations.

• Loads, consisting of small parcels received from different consignors, vary widely in weight according to circumstances, and those furnished at large stations may be expected to be heavier, generally, than those provided at small stations. However this may be, it is necessary to ascertain, with as much correctness as possible, the average weight of load obtained from small parcels of goods received from different consignors, in order to presume, with confidence, that all consignments of general merchandise whose weights separately fall below it furnish, unitedly, loads averagely equal to it. The weight thus found will distinguish the final grade for each division of traffic in the Table of Rates and Charges applying to general merchandise carried in open and in covered wagons. Suitably prepared, therefore, the Table will serve not only to denote the grades for the different kinds of general merchandise when consigned in quantities amounting to average maximum loads, but also to indicate the grades for quantities that are less than average maximum loads, including the smallest parcels.

In all towns and populous districts something is produced, manufactured, prepared, or stored that is needed in other towns and districts. Through the medium of traders, commodities of all kinds are passing, daily, to and from the various centres of population to be used or consumed. These commodities form general merchandise. After discharge at any station on the parent railway, wagons that have conveyed one kind of general merchandise may be reloaded, at the same station, with the same or any other kind of general merchandise. This circumstance is advantageous to all parties concerned, inasmuch as the number of wagons that need to be conveyed, empty, is small in consequence of it. It cannot be expected that at each station just so many wagons, loaded, will be received, daily, as are required for the merchandise to be forwarded. At some stations more, and at other stations fewer wagons, loaded, are received than are wanted for the amount of general merchandise daily tendered for transmission, and the oversupplies have to be conveyed, empty, to those stations that have not a sufficiency. It follows that an addition, as may be found appropriate,

needs to be made to the weights of wagons loaded with general merchandise in order that the conveyance of empty wagons may be included in the calculation of cost.

By charging a sum, per ton of load, for the terminal services of clerkage or portorage in reference to light consignments of general merchandise, the amount yielded may be so small as to be insufficient to defray the cost. Consignments, however insignificant in size or weight, require to be separately entered in the invoices, which occasions the same amount of clerical labour, with respect to each consignment, as other entries relating to small consignments of greater magnitude. They also need separate identification by means of marks or labels in collecting them together to form loads for wagons at the forwarding stations, and again at the receiving stations during and after the process of unloading. Sometimes it is necessary to weigh them. Thus the smallest parcel or the lightest consignment of merchandise takes up, in the aggregate, an appreciable amount of the time and attention of porters in the operations associated with loading and unloading.

To obviate the difficulty thus arising it is requisite, first of all, to fix upon sums, having regard to each division of traffic, for the first and second terminal services of clerkage and portorage respectively, with the intention that they shall form the minimum or lowest charges for those services when performed in relation to light consignments or small parcels. With regard to other terminal services and conveyance there is not the same reason for creating minimum charges. So long as the amount yielded by a sum, per ton of load, for conveyance and terminal services other than clerkage or portorage, applied to the actual weight, forms a part of the total charge for any light consignment, a sufficient recompense is obtained, even though the amount be only a small fraction of a penny.

The next step is to arrive at the weight marking the limit of weight for consignments that are to be deemed light and those that are not to be so regarded. Here it is needful to deal separately with clerkage and portorage, because the calculations will show that the limit of weight must be different for each description of service. Assuming, with regard to each division of traffic, that the minimum charge for the first and second terminal services of clerkage has been fixed upon, the sum, per ton of load, for the terminal services of clerkage relating to the final grade for each division of traffic in the Table prepared for general merchandise, applied to a certain weight, will yield an amount equal to that of the minimum charge. This weight will be the limit of weight for light consignments so far as regards the services of clerkage. Assuming, with regard to each division of traffic, that the minimum charge for the first and second terminal services of portorage has also been fixed upon, the sum, per ton

of load, for the terminal services of portorage likewise relating to the final grade for each division of traffic in the same Table, applied to a certain weight, will yield an amount equal to that of the minimum charge. This weight will be the limit of weight for light consignments so far as regards the services of portorage. The two weights thus obtained will be different, that relating to the services of clerkage being the greater.

Parts of the weights marking the two limits of weight for light consignments of general merchandise in each division of traffic, computed at sums, per ton of load, for the services of clerkage and portorage respectively, will yield different amounts according to the magnitudes of the parts. These amounts will, naturally, be less than the minimum charges that may have been fixed upon, and will need to be increased in each case, so as to be equal to them. It must be borne in mind that, in reference to any grade, the rates, per ton, for conveyance are individually joined to a sum, per ton, for terminal services, and that the former differ greatly as the distance conveyed is long or short, while the latter remains unchanged. Computed at a rate per ton, a consignment weighing, for example, a quarter of a cwt will yield a considerable or an inconsiderable amount according to the magnitude of the rate; but reckoned at a sum, per ton, for terminal services, the resulting amount will be the same for every distance. While the sums, per ton, for conveyance and terminal services combined will apply to the actual weights of light consignments, as in the case of consignments that are not deemed to be light, the resulting amounts, so far as they relate to the terminal charges for the services of clerkage and portorage, will fall short of the respective minimum charges that may have been fixed upon, according as the actual weights fall short of the designated limits of weight.

In these circumstances it will be found expedient to graduate, with regard to each division of general merchandise, the weight denoting the greater of the two limits of weight—and the greater will include the less—and to calculate for each divisional weight, firstly, the amount by which it falls short of the minimum charge that may have been fixed upon for the services of clerkage, and secondly, the amount by which it falls short of the minimum charge that may have been fixed upon for the services of portorage. In the latter case, the limit of weight being less, the number of divisional weights for which calculations will be required will be less also. The amounts or deficiencies thus obtained will decrease as the amounts, yielded by sums per ton, for the divisional weights increase, until the respective limits of weight are reached, at which points the deficiencies will cease. These deficiencies and the divisional weights to which they respectively relate should be entered in a suitable form for the guidance of clerks when invoicing light consignments of general

merchandise carried in open and in covered wagons, in order that appropriate additions may be made to the amounts yielded by the united rates and charges per ton of load

*Exceptional general merchandise*—Articles that may be described as exceptional general merchandise are occasionally tendered for transmission, and are conveyable in wagons designed to carry general merchandise, but, by reason of their bulk or shape, they occupy the whole or a large portion of the space afforded by a wagon without reaching the weight of load marking the final grade for the division of traffic to which the merchandise pertains. In other respects they comply with the conditions attached to general merchandise.

In such cases it is not unreasonable that the weight to be charged for should be that of the load distinguishing the final grade instead of the actual weight of the consignment. For if a wagon weighing five tons contain a load weighing one ton, five-sixths of the amount chargeable for conveyance will be attributable to the wagon alone, and if the same wagon contain a load weighing half-a-ton, the amount chargeable, the distance conveyed being the same, will be eleven-twelfths of the amount chargeable for one ton, or only one-twelfth less. It may be made a condition, therefore, that when, for any reason, a consignment of merchandise occupies a wagon exclusively, and furnishes a load weighing less than the weight of load employed to distinguish the final grade in a Table suitable for such merchandise, the consignment shall not be charged for according to its own weight, but according to the weight of load marking the final grade. In other words, the weight of load employed to distinguish the final grade in a Table must be the minimum weight of load chargeable for the conveyance of any consignment of merchandise to which the Table applies, when exclusively occupying a wagon.

After a Table of Rates and Charges, applicable to general merchandise carried in open and in covered wagons, has been prepared, and the grade appropriate for average maximum loads of each kind of merchandise, according to the manner in which it is packed, has been ascertained, the Table, together with the information which it is necessary to impart, should be printed for the guidance of railway clerks and traders. A list of articles of general merchandise in each division of traffic, the names being alphabetically arranged, and a method of indicating those kinds that furnish full loads, either invariably, frequently, or occasionally, and those kinds that are always consigned in small quantities, will be required, the number of the grade appropriate for full loads of each kind of merchandise, if at any time consigned in quantities of that magnitude, being entered in proximity to its name. The following instructions should accompany the list—

The grade appropriate for full loads of each kind of merchandise

must be deemed to be appropriate for consignments that exceed full loads.

The weights of consignments of each kind of merchandise that are less than full loads must be approximated, respectively, to the weights of loads employed to distinguish the grades succeeding the grade appropriate for full loads.

The weights of consignments of any kind of merchandise invariably despatched in smaller quantities than full loads must be approximated, respectively, to the weights of loads employed to distinguish the grades.

Consignments of merchandise in each division of traffic that weigh less than the weight of load employed to distinguish the final grade must be held to pertain to that grade.

Under these conditions, as the weights of consignments of each kind of general merchandise, beginning with full loads, gradually decrease, the rates and charges, per ton of load, will gradually increase, until the final grade for each division of traffic is reached, which will embrace small consignments of all magnitudes.

The minimum charges that may be fixed upon for the first and second terminal services of clerkage and portorage respectively, with the limits of weight, relating to light consignments or small parcels of general merchandise carried in open and in covered wagons, must be stated. The mode of computing sums, in relation to divisional weights, marking deficiencies in minimum charges for the first and second terminal services of clerkage and portorage respectively performed in reference to light consignments in each division of traffic, should be fully set forth, and, finally, a list of sums, obtained in the manner described, denoting the total deficiencies that require to be added to the amounts yielded by rates and charges, per ton of load, to make up minimum charges, must be furnished. The whole should be printed for the guidance of railway clerks and traders.

The names of articles that may be described as exceptional general merchandise, and the conditions, with regard to charges for conveyance, to which they are to be subject, must form a part of the information supplied.

*Articles of extraordinary weight or dimensions.*—Because of their uncommon weight or dimensions, certain articles of merchandise, as boilers, castings designed for particular purposes, fly-wheels, etc., require to be carried in wagons of peculiar construction having great strength and capacity. The amount of merchandise in this division of traffic is small comparatively, and a few wagons of different sizes are, probably, found sufficient for its needs.

If the weights of peculiarly-built wagons and the weights of loads which they are individually registered to carry have equal ratios, such weights of loads joined with such weights of wagons may be employed

to distinguish the initial grade in a Table prepared for merchandise of this character. Other grades must be added in order to make provision for full loads whose weights are less than those employed to mark the initial grade. The approximation of the weight of any consignment of merchandise providing a full load for a peculiarly-built wagon to a weight of load employed to distinguish a grade will relate to the actual weight of the consignment and the actual weight of the wagon in which it is carried, and not to an average maximum weight of load and an average weight of wagon. Consequently, there will be no occasion to permanently grade articles of extraordinary weight or dimensions that furnish full loads.

The Table must contain grades sufficiently numerous to provide, to a reasonable extent, for the approximation of the weights of consignments that are less than full loads.

It should be made a condition that any consignment of merchandise occupying a peculiarly-built wagon, and having a weight less than that of the load for such wagon marking the final grade in the Table, must be charged an amount for conveyance not less than as for the weight of such load.

Inasmuch as suitable loads are obtainable at few stations, a peculiarly-constructed wagon may have to be conveyed, empty, a considerable distance to receive a load, and, after the load has been conveyed to its destination and disposed of, may have again to be conveyed, empty, a considerable distance before it can be reloaded. For this reason the weights of peculiarly-built wagons employed to carry articles of uncommon weight or dimensions will need to be greatly increased in order that the conveyance of empty wagons may be included in the calculation of cost.

A Table of Rates and Charges prepared for this division of traffic, with the names, alphabetically arranged, of articles of merchandise that usually provide loads for peculiarly-built wagons, will be necessary. The greatest dimensions, as well as the greatest weight, of single articles that may be carried in each peculiarly-constructed wagon should be stated.

The Table, the list of articles of merchandise, the conditions of conveyance, and the requisite instructions should be printed for the information of railway clerks and traders.

*Articles of great length occupying two or more wagons*—Certain kinds of merchandise, as round or square timber, iron bars, beams, columns, shafts, boilers of ordinary dimensions, telegraph-posts, ladders, etc., require, by reason of their length, two or more wagons for transport. For merchandise of this character it is found convenient to build wagons without sides, each vehicle having the usual platform, but fitted with a "bolster" moving on a pivot in the centre, on which one end of the

long articles may rest, stanchions, and a chain for binding the load. The upper structure of a wagon built in this fashion is reduced to the lowest point, the weight of the wagon being correspondingly lessened.

It frequently happens that when wagons are loaded with this description of merchandise the articles project beyond the ends of the wagons on which they are borne, rendering it necessary, for protective purposes, to employ additional wagons—termed “safety” wagons when in use—to accompany the loaded wagons to their destination. Safety-wagons are a source of considerable expense, and it is desirable to dispense with them whenever it is possible. This can best be done by constructing wagons of various lengths but of uniform shape, to enable the loaders to select wagons suitably adapted to the length of the article or articles to be carried. When, however, the use of protective wagons is unavoidable, the cost must be taken into account as if the vehicles carried the loads. To facilitate the calculation of cost, it is necessary to find, by computation, the average weight of wagon employed to convey articles of great length.

It is incumbent on a railway company to define the limits of length to which articles that demand two or more wagons for their transport must be circumscribed, the greatest length of wagon provided for the purpose of carrying long articles having to be taken into consideration in defining the respective limits in relation to two, three, or more wagons.

A Table of Rates and Charges, applicable to merchandise consisting of articles of great length, will need to be prepared. Since a consignment may occupy two, three, or more wagons, each grade will require distinguishing weights of loads, joined with weights of wagons severally corresponding to the number of wagons that may be occupied by single consignments.

The weights and dimensions of consignments that amount to full loads, in this division of traffic, are so various that it is not to be expected that the carrying power or receptive space of vehicles can be utilized to the greatest extent at each time of loading. Consequently, it will be needful to ascertain, as in the case of general merchandise, the weight of the greatest load obtainable in practice, or the average as distinguished from the potential maximum weight of load, with regard to consignments of each kind of merchandise characterized by great length, when occupying two, three, or more wagons, respectively, and to approximate the weights thus obtained to the weights of loads distinguishing the grades in the Table. To arrive at the average maximum weights of loads with some approach to correctness, it is needful, in regard to consignments furnishing full loads for two or more wagons, to record, during a reasonable period, the separate weights of loads and wagons, each with each, as a basis for calculation.



By means of a reasonable extension of the grades, provision must be made for the approximation of the weights of consignments, occupying two or more wagons, that are less than full loads.

When a consignment of merchandise occupies two wagons, and is of less weight than that of the load for two wagons marking the final grade in the Table, it may be made a condition that it shall be charged an amount for conveyance not less than as for the weight of such load. The same rule will apply to consignments occupying three or more wagons under like circumstances.

Usually bolster-wagons, that have been employed to carry long articles are despatched, empty, to those stations at which merchandise, furnishing suitable loads is regularly forthcoming, or else to stations where occasional need for such wagons arises. It is but seldom that they can be reloaded at the stations where they are discharged. It is probable, therefore, that the weights of wagons carrying articles of great length will require to be doubled, or nearly so, in order that the conveyance of empty wagons may be included in the calculation of cost.

When the Table of Rates and Charges has been prepared, and the average maximum weights of loads obtainable from the different descriptions of merchandise have been ascertained and approximated to the weights of loads distinguishing the grades, a list of articles of merchandise contained in this division of traffic, with the names in alphabetical order, will be required; and the number of the grade appropriate for full loads, according to the number of wagons employed to carry each consignment, must be entered opposite each name. The limits of length to which loads for two, three, or more wagons are to be restricted, respectively, must also be stated. The following instructions should accompany the list.—

The grade appropriate for full loads of each kind of merchandise, according to the number of wagons occupied, must be deemed to be appropriate for consignments that exceed full loads.

The weights of consignments of each kind of merchandise that are less than full loads, according to the number of wagons occupied, must be approximated, respectively, to the weights of loads employed to distinguish the grades succeeding the grade appropriate for full loads.

The weights of consignments of any kind of merchandise, occupying two or more wagons, invariably despatched in smaller quantities than full loads, must be approximated, respectively, to the weights of loads employed to distinguish the grades.

Consignments of merchandise that weigh less than the weights of loads employed to distinguish the final grade, according to the number of wagons occupied by each consignment, must be charged amounts for conveyance not less than as for such weights respectively.

The Table, the list of articles of merchandise, with the numbers of the respective grades for full loads, the conditions of conveyance, and the requisite instructions, should be printed for the information of railway clerks and traders.

*Coal, lime, etc*—Wagons built to carry a particular kind of merchandise, as coal or lime, and exclusively employed for the purpose, may be loaded up to their maximum carrying power or capacity, as the case may be, in every instance, if traders give due attention to the provision of loads. In their construction, the bearing part and the part designed for the reception of the load should be heedfully calculated, with especial regard to the kind of merchandise intended to be carried, because too great an oversupply of power or receptive space implies superfluous weight of structure. Wagons of various sizes may be built, and, consequently, may have various weights. So long as the ratios are equal, the grade for full loads of any description of merchandise carried in wagons of different weights will be the same. Thus wagons weighing 4,  $4\frac{1}{2}$ , and 5 tons, carrying full loads of 8, 9, and 10 tons respectively, furnish instances of equal relative magnitudes, the weight of wagon proportionate to unit-weight of load being half-a-ton in each case.

On most railways coal, lime, and analogous merchandise are carried in wagons provided by traders interested in each commodity, and the vehicles are of so many makes and sizes that there is ground to believe that their weights and the weights of loads which they are individually registered to carry have not always the same ratio, and, consequently, that different grades will be required for the approximation of full loads of the same kind of merchandise. If this be so, the sooner the matter is rectified the better, because it is highly important that wagons should afford equal advantages when built for the purpose of carrying one kind of merchandise. A few railway companies supply wagons to carry coal, lime, etc., and it may be presumed, in such cases, having regard to each description of merchandise, that the weights of the wagons and the weights of the loads which they are respectively registered to carry have the same or nearly the same ratio.

Two Tables of Rates and Charges will need to be prepared for this division of traffic; one to apply to coal, lime, and similar merchandise when carried in wagons provided by the railway company, the other to apply to the same kinds of merchandise when carried in wagons supplied by traders. Seeing that provision has to be made for full loads only, it may be assumed that a small number of grades will be sufficient for all requirements. Different weights of loads joined with different weights of wagons, as may be found necessary, will have to be employed to distinguish each grade.

The weights of full loads obtained from each kind of merchandise when contained in wagons of the same size ought not to differ greatly,

and the weights of the wagons should agree so nearly as to admit of the computation of an average weight of wagon. The loads, in each case, should be the maximum loads which the wagons are qualified to carry, measured by the bearing power or the receptive space afforded. It is reasonable to expect, therefore, that the weights of full loads of the same kind of merchandise when carried in wagons of one size and weight, averagely calculated, should agree, or nearly so, in which case they will approximate to one of the weights of loads joined with the appropriate weight of wagon marking a grade. Should they, from any cause, materially differ, they will approximate to two or more weights of loads marking different grades, and it will then become necessary to make distinctions with regard to the same kind of merchandise, according to the outcome of the approximations.

After being discharged, wagons that have carried coal, lime, and similar merchandise are, almost invariably, returned to the collieries and places of production in order to be reloaded. Hence the weights of wagons carrying loads of such merchandise require to be doubled in order that the conveyance of empty wagons may be included in the calculation of cost.

After the two Tables of Rates and Charges have been prepared, and the maximum weights of loads obtainable from the different descriptions of merchandise have been approximated to the weights of loads distinguishing the grades, a list of articles of merchandise—which will be identical for both Tables—comprised in this division of traffic, with the names alphabetically arranged, will be necessary, and the number of the grade appropriate for full loads must be entered in proximity to each name. If, for any reason, full loads of one kind of merchandise be approximated to two or more grades, the circumstance must be stated and the cause for discriminating should be plainly shown. The Tables, the lists of articles of merchandise, with the numbers of the respective grades for full loads, the conditions of conveyance, and the necessary instructions, should be printed for the information of railway clerks and traders.

*Merchandise carried in traders' wagons that would otherwise be returned, empty, to private sidings.*—Timber intended to be used in mines, and commonly called pit-wood, is received at certain ports from foreign countries, and, at times, it is found convenient to convey it to the collieries in traders' wagons that have carried coal, which would otherwise be returned, empty, to private sidings adjacent to the collieries. Similarly, wire ropes, barrels of oil and grease, etc., are sometimes conveyed from stations to private sidings in traders' wagons that have carried coal. Probably traders' wagons built to carry merchandise other than coal may occasionally be used to carry different kinds of merchandise from stations to private sidings, instead of being conveyed,

empty, to those places. The cost of conveying empty wagons having to be added to the cost of conveying loaded wagons, it must be supposed that the addition has already been made. Consequently, when traders' wagons are employed to carry merchandise from stations to private sidings, instead of being conveyed empty, the calculation of rates for conveyance and charges for terminal and other services will refer to loads only and not to wagons.

It is necessary to create a new division of traffic to include merchandise carried in the circumstances described. A Table containing one column of rates, calculated for consecutive distances, joined to charges for terminal and other services, per ton of load, will suffice for this division of traffic. It should be printed, together with any instructions or information which it is necessary to impart, for the guidance of railway clerks and traders.

*Vehicles running on their own wheels*—Locomotives, tenders, wagons, and other vehicles designed to be used on railways occasionally form consignments of merchandise, and are conveyed, running on their own wheels, to their destinations. In these circumstances, rates for conveyance and charges for terminal services require to be calculated in reference to the unit-weight of vehicle alone. Vehicles constituting this division of traffic are usually conveyed between private sidings and private sidings, or between private sidings and railway junctions, according as the makers or repairers of the vehicles execute orders on behalf of traders or railway companies.

A Table of Rates and Charges prepared for merchandise in this division of traffic needs to have only one column. The rates, calculated for consecutive distances, joined to charges for terminal and other services, per ton of vehicle, will apply to consignments of all magnitudes.

The Table, with a list of the kinds of vehicles comprised in this division of traffic, and other information that may be requisite, should be printed for the guidance of railway clerks and traders.

*Live stock*.—Live stock differs from the generality of merchandise in the circumstance that animals cannot be stowed one upon another in wagons, but must stand, side by side, without being incommoded by any superincumbent mass. They may, however, be packed closely together so as to fully occupy the floors of wagons. It follows that large animals, full grown and well fed, as horses and cattle, occupy, when standing, much of the receptive space of wagons, and furnish full loads of great weight; while smaller animals, as calves, sheep, and pigs, take up a less part of the receptive space and provide full loads of less weight. It is essential that the weight of live stock should be obtained, either accurately by means of weighing-machines, or, with some approach to correctness, by estimating it, since the cost of transport is largely influenced by this property of matter. Doubtless difficulties attend the use of weighing-

machines applied to animals, but it is indispensable that the weight should be arrived at in one way or another.

Railway companies build wagons conformably to the needs of each description of traffic arising on their respective systems, so that some companies have only one size of cattle-wagon and other companies have more. Probably not more than three sizes of cattle-wagons are provided by any railway company, and they are usually described as large, medium, and small, according to the lengths of the wagons. Assuming that three sizes of wagons are made use of, it is requisite to ascertain, by computation, the average weight of wagon of each size, the greatest weight of load consisting of live stock which each size of wagon may carry, and, if in proportion, to employ such weights of loads, joined with the respective weights of wagons, to distinguish the initial grade in a Table of Rates and Charges prepared for live stock. Other grades must be added thereto in order that consignments of live stock furnishing full loads of different weights may be suitably approximated. The weights of full loads of any description of live stock are subject to variation, inasmuch as consignments of one kind of animal furnish full loads of different weights according to age or breed, one breed sometimes producing taller animals than those of another breed. Also, on occasions it may be found convenient and practicable to load a wagon with two or more kinds of animals. Commercial considerations and humanity alike forbid that animals should be packed for transport too closely, or so as to incur injury, and, therefore, in loading wagons with live stock some restriction is necessary, the extent of which must be governed by the circumstances in each case.

For these reasons it is unadvisable to attempt to grade, permanently, the different kinds of live stock consigned in quantities furnishing full loads, but to let such loads, agreeably to their ascertained or estimated weights, be individually approximated to the weights of loads, joined with the appropriate weights of wagons, distinguishing the grades in the Table. By this arrangement, a consignment of live stock providing more than a full load and occupying two or more wagons, one of which might not be fully loaded, would be dividedly approximated to the weights of loads marking the grades according to the weight of load carried in each wagon.

Provision must be made, by a reasonable extension of the grades, for the approximation of the weights of consignments that are less than full loads.

A consignment of live stock exclusively occupying a wagon, and having a weight less than the weight of load, joined with the appropriate weight of wagon, employed to distinguish the final grade in the Table, must be charged an amount for conveyance not less than as for the weight of such load

Some of the wagons that have carried live stock from a port or a country station to a large town for sale are often reloaded with the same animals and despatched to other towns or country stations in the vicinity, as may be required by traders. But, finally, all such wagons need to be returned, empty, to the ports or country stations where this kind of traffic is periodically forthcoming. Consequently, the weights of wagons carrying live stock will have to be considerably increased so that the conveyance of empty wagons may be included in the calculation of cost.

It is needful to prepare a Table of Rates and Charges applicable to live stock, and a list of the different kinds of animals usually providing loads in this division of traffic, together with the number and weight of animals of each kind, according to age, breed, condition, or other characteristic, estimated to furnish a full load for each size of wagon.

The Table, the list of animals, the needful instructions, and the conditions that it may be found necessary to impose should be printed in a suitable form for the guidance of railway clerks and the information of traders.

The sum to be made use of as a factor with the weights of loads and wagons, for the purpose of calculating rates for conveyance, should be chosen, firstly, with the intention that it shall be an indivisible measure of value for a moderately short distance, which will form the initial distance, and, secondly, that it shall afford facilities for calculation and yet be reasonably near the sum that would be made use of were this consideration excluded. The rates, calculated by means of a sum selected with the objects stated, will relate to the successive grades in each Table, and, beginning with the initial distance, to consecutive distances that are multiples of the initial distance. The rates for each distance will form a scale of rates. The scales of rates must be progressively numbered, the rates in every scale being the product of the rates in the first scale multiplied by the number of the scale. If the initial distance be one mile, the consecutive distances will be whole miles, and will coincide with the figures employed to number the scales. In that case, the rates for all distances not exceeding one mile will be those in Scale 1; the rates for all distances over one mile and not exceeding two miles will be those in Scale 2, and so with regard to the rates for succeeding distances.

Owing to the varied cost of constructing railways, or other reasons, some railway companies will require to charge different rates for conveyance. Besides, after the rates chargeable by a railway company have been calculated and fixed, a time might come when, on account of the dearness or cheapness of fuel, or other cause, it would be requisite to raise or lower them. To effect changes by altering the figures denoting the rates would occasion a great amount of labour, and the consequent multiplicity of rates would be confusing to clerks and traders.

Instead of altering the figures representing the rates, it is simpler and equally effective to alter the distances for which the rates are calculated. By adopting this mode of procedure the scales of rates may be permanently established and used for all Tables of Rates. The initial distance that a railway company may employ in reference to rates for conveyance will, therefore, be a matter of importance, since it will determine the magnitudes of the consecutive distances to which the scales of rates are to apply, and, consequently, will affect the amounts chargeable for conveyance. The initial distance and the consecutive distances, which must be multiples of it, are not to be altered so long as the conditions of conveyance remain the same. The provision of wagons by traders furnishes an instance in which the conditions are altered, since the interterminal service of truckage, relating to wagons, is then no longer rendered by the railway company. In that case, an increased initial distance, with correspondingly increased consecutive distances, would have to be calculated and prefixed to the scales of rates in the Table or Tables concerned, in order to bring about the needful alterations in the amounts chargeable for conveyance.

For the purpose of illustration, let it be assumed, in reference to a given railway, that the consecutive distances, prefixed to the scales of rates, are whole miles, the initial distance being one mile, and that it is needful to increase the amounts chargeable for conveyance by ten per cent, or one-tenth. This may be accomplished in two ways. If it be done by means of a change in the figures denoting the rates, then, by expressing the rates as unity in tenths, or in fractions of the same denomination as the fraction to be added, when increased they become eleven-tenths—one being added to the numerator. If it be done by means of a change in the distances, the distances may also be expressed as unity in tenths, but they require to be lessened, and one being added to the denominator they become ten-elevenths. By altering the initial distance to ten-elevenths of one mile, and the consecutive distances so as to be multiples of ten-elevenths of one mile instead of multiples of one mile, the scales of rates remaining unchanged, the amounts chargeable for conveyance will be increased by one-tenth. But let it be assumed that it is necessary to decrease the amounts chargeable for conveyance by ten per cent, or one-tenth. If it be accomplished by altering the figures representing the rates, then, by expressing the rates as unity in tenths, or in fractions of the same denomination as the fraction to be subtracted, when decreased they become nine-tenths—one being taken from the numerator. If it be done by altering the distances, the distances may also be expressed as unity in tenths, but they need to be increased, and one being subtracted from the denominator they become ten-ninths. By altering the initial distance to one mile and one-ninth of a mile, and the consecutive distances so as to be multiples

of one mile and one-ninth of a mile instead of multiples of one mile, the scales of rates remaining unchanged, the amounts chargeable for conveyance will be decreased by one-tenth.

Again, let it be supposed that it is requisite to increase the amounts chargeable for conveyance by two-fifteenths. By expressing the distances as unity in fifteenths and adding two to the denominator, fifteen-seventeenths is obtained. By altering the initial distance to fifteen-seventeenths of one mile, and the consecutive distances so as to be multiples of fifteen-seventeenths of one mile instead of multiples of one mile, the scales of rates continuing unchanged, the object desired will be gained. Further, let it be supposed that it is necessary to decrease the amounts chargeable for conveyance by two-fifteenths. By again expressing the distances as unity in fifteenths and subtracting two from the denominator, fifteen-thirteenth is obtained. By altering the initial distance to one mile and two-thirteenth of a mile, and the consecutive distances so as to be multiples of one mile and two-thirteenth of a mile instead of multiples of one mile, the scales of rates remaining unchanged, the effect intended will be produced.

The advantage gained by regulating the amounts chargeable for conveyance in the manner proposed consists in the circumstance that, whatever cause may arise to warrant alteration, the change may be brought to pass without altering the scales of rates, and with the least disturbance of the figures employed in the Tables. It must be noted, however, that any alteration of charges for terminal and other services will necessitate an alteration of the figures representing the rates and charges combined, but should a change of distances only be required, the scales of united rates and charges may remain unaltered.

If acceptable to railway companies and traders, the rate of progression determining consecutive distances may be increased at stated intervals. In the event of this course being adopted, the scale of rates appropriate to the middle distance of the increased consecutive distance, or as near to the middle distance as may be practicable, must be regarded as appropriate for the whole consecutive distance. For the sake of illustration, let it be assumed, in reference to a given railway, that the initial distance is one mile, and that the rate of progression, up to a stated distance, is one mile. If, at the end of the stated distance, the rate of progression were doubled, or increased from one mile to two miles, instead of every scale of rates only one of every two consecutive scales of rates would have to be employed for succeeding distances. In that case, the first scale of the two consecutive scales of rates would be appropriate for each consecutive distance. If, at the end of a second stated distance, the rate of progression were increased from two miles to three miles, only one of every three consecutive scales of rates would have to be used for succeeding distances. In that event, the second scale of the



three consecutive scales of rates would be appropriate for each consecutive distance. This mode of procedure would need to be continued with regard to rates of progression greater than three miles. If the initial distance were a fraction of one mile or one mile and a fraction, the method of arriving at the scales of rates suitable for increased consecutive distances caused by alterations in the rate of progression would be the same as for an initial distance of one mile.

The weights of wagons proportionate to unit-weights of loads are intended to remain unchanged in all circumstances, but the weights of loads and the weights of wagons with which they are individually joined may be altered according to requirements, provided that their respective relative magnitudes be maintained. Because of the equality or similarity of ratios, obtained by proceeding in the manner described, the united rates and charges, per ton, applied to the weights of loads distinguishing the grades will, of course, yield amounts for transport commensurate with the value of the services rendered. But the weights of many consignments that are less than full loads will come between the weights of loads distinguishing adjoining grades, and the unit-weight of load and proportionate weight of wagon computed for either of the adjoining grades will have relative magnitudes somewhat different from those of the weights of loads and the weights of wagons with which they are to be joined, referred to. Consequently, the rates and charges, per unit-weight of load, calculated for either of the grades will be too high or too low because of the dissimilarity of ratios, and it becomes necessary to point out the course to be followed when the circumstances are as described.

When a consignment, less than a full load, provides a load whose weight comes between a greater and a lesser weight of load marking adjoining grades, the sum representing rates and charges, per ton, calculated for the lesser weight of load must be employed as a factor with the intervening weight of load, so long as the amount produced is less than, or equal to, the amount chargeable for the greater weight of load, and must not exceed it. Inasmuch as the sum representing rates and charges, per ton, to be employed under this rule will always be somewhat greater than it would be if computed commensurately, it follows that between the weights of loads respectively distinguishing adjoining grades in any Table there will be a certain intervening weight of load, which, multiplied by a larger sum per ton, will yield an amount equal to that resulting from the multiplication of the greater distinguishing weight of load by a smaller sum per ton. This weight of load, whatever it may be in each case, and the greater distinguishing weight of load, will, together, form limits of weight within which all magnitudes of loads will be debitable with the same amount, namely, the amount chargeable for the greater distinguishing weight of load.

To guard against the liability of clerks to enter in the invoices larger amounts, with respect to consignments that furnish intervening weights of loads, than ought to be entered, it is necessary to compute, by means of the sums, per ton, forming the scales of united rates and charges for consecutive distances, the amounts respectively chargeable for loads whose weights distinguish the grades, and to enter such amounts, individually, in proximity to the sums by whose agency they have been calculated. Computed for each series of weights of loads employed to mark the grades in each Table, these amounts will be very numerous. They will, however, serve as *limits* to prevent the overcharging of consignments that furnish intervening weights of loads which are less than full loads, and will save the labour of calculation in regard to consignments whose weights correspond with the weights of loads distinguishing the grades. The task of computation will be light, and the amounts, when correctly obtained and intelligibly set forth, will afford increased facilities in the work of invoicing and of checking the amounts entered in the invoices.

It may be observed that this method of arriving at the amounts chargeable for consignments of merchandise that furnish intervening weights of loads is wholly in favour of railway companies, but the interests of traders will not be unduly affected if the grades be sufficiently numerous, or, in other words, of small extent, individually. The conditions of transport—of which the method of charging for a consignment according to the weight of load which it provides will form an important part—ought to be widely made known, so that traders may be enabled to regulate the magnitudes of their consignments in the manner most conducive to their own benefit

In proximity to the shafts leading to their mines coal-masters usually make sidings on land set apart for the purpose, and connect them with a railway by means of a junction in each case, the arrangement saving the expense of cartage. Such sidings are called private sidings to distinguish them from goods stations, but the uses of both are identical. The weight of coal dealt with at these places is very great, and fully justifies the procedure taken. In addition to sidings, many coal-masters provide their own wagons. Coal-dealers, who are not coal-masters, also furnish their own wagons in numerous instances. In either event, viewed as the action of traders, the result is the same. The owners of private sidings commonly provide locomotive power for the purpose of moving wagons from one position in the sidings to another, as may be necessary. The provision, by traders, of sidings, wagons, and shunting power has the effect of dividing the services fulfilled by a railway company under ordinary conditions, some of the services continuing to be performed by the railway company, while some are fulfilled by traders

In order that the matter may be clearly apprehended, it is expedient to give, in detail, firstly, a list of the services fulfilled, and the liabilities and obligations undertaken, by a railway company when general merchandise is conveyed in the railway company's wagons from stations to stations on the same railway, secondly, a list of the services fulfilled, and the liabilities and obligations undertaken, by a *railway company* when coal is conveyed in traders' wagons from private sidings to stations on the same railway; and thirdly, a list of the services, etc., fulfilled by *traders* when coal is conveyed in traders' wagons from private sidings to stations on the same railway. The services, etc., named in the second and third lists comprehend the services, etc., enumerated in the first list. The service of portage, in reference to coal, is not performed by railway companies.

Before entering on this task, it is needful to say that when wagons have to be sent, empty, from the stations where they have been discharged to other stations to be loaded, the services of railage, haulage, and truckage, fulfilled in reference to the empty wagons prior to despatch, pertain to first terminal services, although performed at second terminal stations. Charges for those portions of the first terminal services which are performed at second terminal stations must be joined to charges for the second terminal services of the same denomination, respectively.

To prevent misconception, it may be observed that by providing wagons a railway company or a trader renders the service of truckage relating to such wagons during each journey.

I. DETAILED LIST OF SERVICES FULFILLED, AND LIABILITIES AND OBLIGATIONS UNDERTAKEN, BY A RAILWAY COMPANY WHEN GENERAL MERCHANDISE IS CONVEYED IN THE RAILWAY COMPANY'S WAGONS FROM STATIONS TO STATIONS ON THE SAME RAILWAY.

Services, etc.,  
progressively  
numbered

- |    |  |  |
|----|--|--|
| 1  | Interterminal service of railage, including taxes                        | } Constituting the service of conveyance.              |
| 2  | Interterminal service of haulage   |  |
| 3. | Interterminal service of truckage, relating to locomotives, etc.         |  |
| 4. | Interterminal service of truckage, relating to loaded and empty wagons.  |  |
| 5  | First terminal service of railage, including taxes                       | } Constituting the first terminal service of stoppage. |
| 6. | First terminal service of haulage  |  |
| 7. | First terminal service of truckage, relating to locomotives, etc.        |  |
| 8. | First terminal service of truckage, relating to loaded and empty wagons. |  |

Services, etc.,  
progressively  
numbered

9. That portion of the first terminal service of railage which is fulfilled in relation to loaded and empty wagons during their stay in the sidings at first terminal stations, including taxes.
10. That portion of the first terminal service of haulage which is fulfilled in relation to loaded and empty wagons during their stay in the sidings at first terminal stations.
11. That portion of the first terminal service of truckage which is fulfilled in relation to loaded and empty wagons during their stay in the sidings at first terminal stations.
12. First terminal service of portorage.
13. First terminal service of clerkage.
14. Junctional services of railage, including taxes.
15. Junctional services of haulage.
16. Junctional services of truckage, relating to locomotives, etc.
17. Junctional services of truckage, relating to loaded and empty wagons.
18. Junctional services of railage, relating to loaded and empty wagons while staying in the sidings at junctions, including taxes.
19. Junctional services of haulage, relating to loaded and empty wagons while staying in the sidings at junctions.
20. Junctional services of truckage, relating to loaded and empty wagons while staying in the sidings at junctions.
21. Second terminal service of railage, including taxes.
22. Second terminal service of haulage.
23. Second terminal service of truckage, relating to locomotives, etc.
24. Second terminal service of truckage, relating to loaded and empty wagons.
25. Second terminal service of railage, relating to loaded wagons during their stay in the sidings at second terminal stations, including taxes.
26. Second terminal service of haulage, relating to loaded wagons during their stay in the sidings at second terminal stations.
27. Second terminal service of truckage, relating to loaded wagons during their stay in the sidings at second terminal stations.
28. That portion of the first terminal service of railage which is fulfilled in relation to empty wagons during their stay in the sidings at second terminal stations before they are despatched to other stations to be loaded, including taxes.
29. That portion of the first terminal service of haulage which is fulfilled in relation to empty wagons during their stay in the

Constituting the  
junctional ser-  
vices of stop-  
page.

Constituting the  
second termi-  
nal service of  
stoppage.

Services, etc.,  
progressively  
numbered

sidings at second terminal stations before they are despatched to other stations to be loaded.

- 30 That portion of the first terminal service of truckage which is fulfilled in relation to empty wagons during their stay in the sidings at second terminal stations before they are despatched to other stations to be loaded
31. Second terminal service of portorage.
- 32 Second terminal service of clerkage.
33. Exposure to loss (Risk).
- 34 Extraneous services.

## 2. DETAILED LIST OF SERVICES FULFILLED, AND LIABILITIES AND OBLIGATIONS UNDERTAKEN, BY A *RAILWAY COMPANY* WHEN COAL IS CONVEYED IN TRADERS' WAGONS FROM PRIVATE SIDINGS TO STATIONS ON THE SAME RAILWAY.

Reference to Nos  
of services, etc.,  
in the first list

- |  |  |
|--|--|
| 1 Interterminal service of railage, including taxes.   | } Constituting part of the service of conveyance.              |
| 2 Interterminal service of haulage.  |  |
| 3 Interterminal service of truckage, relating to locomotives, etc.   |  |
| 5 First terminal service of railage, including taxes   | } Constituting part of the first terminal service of stoppage  |
| 6 First terminal service of haulage.   |  |
| 7. First terminal service of truckage, relating to locomotives, etc.   |  |
| 13. First terminal service of clerkage.  | } Constituting part of the junctional services of stoppage     |
| 14 Junctional services of railage, including taxes.  |  |
| 15. Junctional services of haulage   |  |
| 16 Junctional services of truckage, relating to locomotives, etc   | } Constituting part of the second terminal service of stoppage |
| 18 Junctional services of railage, relating to loaded and empty wagons while staying in the sidings at junctions, including taxes. |  |
| 19. Junctional services of haulage, relating to loaded and empty wagons while staying in the sidings at junctions.                 |  |
| 21. Second terminal service of railage, including taxes  | } Constituting part of the second terminal service of stoppage |
| 22 Second terminal service of haulage.   |  |
| 23 Second terminal service of truckage, relating to locomotives, etc.  |  |
| 25 Second terminal service of railage, relating to loaded wagons   |  |

Reference to Nos.  
of services, etc.,  
in the first list

- during their stay in the sidings at second terminal stations,  
including taxes
- 26 Second terminal service of haulage, relating to loaded wagons during their stay in the sidings at second terminal stations.
- 28. That portion of the first terminal service of railage which is fulfilled in relation to empty wagons during their stay in the sidings at second terminal stations before they are despatched to private sidings to be loaded, including taxes.
- 29 That portion of the first terminal service of haulage which is fulfilled in relation to empty wagons during their stay in the sidings at second terminal stations before they are despatched to private sidings to be loaded
- 32 Second terminal service of clerkage.
- 33 Exposure to loss (Risk)
- 34 Extraneous services.

3 DETAILED LIST OF SERVICES, ETC., FULFILLED BY *TRADERS* WHEN COAL IS CONVEYED IN *TRADERS'* WAGONS FROM PRIVATE SIDINGS TO STATIONS ON THE SAME RAILWAY.

Reference to Nos.  
of services, etc.,  
in the first list

- 4 Interterminal service of truckage, relating to loaded and empty wagons, constituting part of the service of conveyance
- 8. First terminal service of truckage, relating to loaded and empty wagons, constituting part of the first terminal service of stoppage.
- 9. That portion of the first terminal service of railage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations, including taxes.
- 10. That portion of the first terminal service of haulage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations.
- 11. That portion of the first terminal service of truckage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations.
- 12 First terminal service of portorage.
- 17 Junctional services of truckage, relating to loaded and empty wagons, constituting part of the junctional services of stoppage.
- 20. Junctional services of truckage, relating to loaded and empty wagons, while staying in the sidings at junctions.
- 24 Second terminal service of truckage, relating to loaded and empty

Reference to Nos.  
of services, etc.,  
in the first list

- wagons, constituting part of the second terminal service of stoppage
- 27 Second terminal service of truckage, relating to loaded wagons during their stay in the sidings at second terminal stations.
- 30 That portion of the first terminal service of truckage which is fulfilled in relation to empty wagons during their stay in the sidings at second terminal stations, before they are despatched to private sidings to be loaded.
- 31. Second terminal service of portorage.

Iron-masters and others, for the same reasons that actuate coal-masters, also provide their own sidings and shunting-power, and, for the whole or a part of the articles manufactured and of the materials used in the process of manufacture, supply their own wagons. The fuel required by these traders has often to be sent by railway. The services, etc., fulfilled by traders, in the altered circumstances, are given in the next list, all other services, etc., mentioned in the first list, being performed by the railway company.

#### 4 DETAILED LIST OF SERVICES, ETC, FULFILLED BY TRADERS WHEN COAL AND OTHER KINDS OF MERCHANDISE OF AN ANALOGOUS CHARACTER ARE CONVEYED IN TRADERS' WAGONS FROM PRIVATE SIDINGS TO PRIVATE SIDINGS ON THE SAME RAILWAY.

Reference to Nos.  
of services, etc.,  
in the first list

- 4 Interterminal service of truckage, relating to loaded and empty wagons constituting part of the service of conveyance.
- 8. First terminal service of truckage, relating to loaded and empty wagons, constituting part of the first terminal service of stoppage
- 9 That portion of the first terminal service of railage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations, including taxes.
- 10 That portion of the first terminal service of haulage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations.
- 11. That portion of the first terminal service of truckage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations.
- 12. First terminal service of portorage.

Reference to Nos  
of services, etc.,  
in the first list

17. Junctional services of truckage, relating to loaded and empty wagons, constituting part of the junctional services of stoppage.
- 20 Junctional services of truckage, relating to loaded and empty wagons, while staying in the sidings at junctions.
- 24 Second terminal service of truckage, relating to loaded and empty wagons, constituting part of the second terminal service of stoppage.
25. Second terminal service of railage, relating to loaded wagons during their stay in private sidings corresponding to second terminal stations, including taxes.
- 26 Second terminal service of haulage, relating to loaded wagons during their stay in private sidings corresponding to second terminal stations.
- 27 Second terminal service of truckage, relating to loaded wagons during their stay in private sidings corresponding to second terminal stations.
28. That portion of the first terminal service of railage which is fulfilled in relation to empty wagons during their stay in private sidings corresponding to second terminal stations, before they are despatched to other private sidings to be loaded, including taxes.
- 29 That portion of the first terminal service of haulage which is fulfilled in relation to empty wagons during their stay in private sidings corresponding to second terminal stations, before they are despatched to other private sidings to be loaded.
- 30 That portion of the first terminal service of truckage which is fulfilled in relation to empty wagons during their stay in private sidings corresponding to second terminal stations, before they are despatched to other private sidings to be loaded.
- 31 Second terminal service of portorage

In a comparatively few instances, engineers, machinists, paper-makers, manufacturers of chemicals, cotton-spinners and manufacturers, bleachers, and traders engaged in other businesses, provide their own sidings and shunting-power. They also employ men to perform the service of portorage at such sidings, but they do not, usually, supply their own wagons. The services, etc., fulfilled by traders when general merchandise is forwarded *from stations to private sidings*, and when it is forwarded *from private sidings to stations*, in wagons provided by the railway company, are detailed in the next two lists; the remainder of the services, etc., enumerated in the first list, being performed, in each case, by the railway company.



5. DETAILED LIST OF SERVICES, ETC., FULFILLED BY TRADERS WHEN GENERAL MERCHANDISE IS CONVEYED IN THE RAILWAY COMPANY'S WAGONS *FROM STATIONS TO PRIVATE SIDINGS* ON THE SAME RAILWAY.

Reference to Nos  
of services, etc.,  
in the first list.

25. Second terminal service of railage, relating to loaded wagons during their stay in private sidings corresponding to second terminal stations, including taxes.
- 26 Second terminal service of haulage, relating to loaded wagons during their stay in private sidings corresponding to second terminal stations
28. That portion of the first terminal service of railage which is fulfilled in relation to empty wagons during their stay in private sidings corresponding to second terminal stations, before they are despatched to stations to be loaded, including taxes
- 29 That portion of the first terminal service of haulage which is fulfilled in relation to empty wagons during their stay in private sidings corresponding to second terminal stations, before they are despatched to stations to be loaded.
- 31 Second terminal service of portorage

6 DETAILED LIST OF SERVICES, ETC., FULFILLED BY TRADERS WHEN GENERAL MERCHANDISE IS CONVEYED IN THE RAILWAY COMPANY'S WAGONS *FROM PRIVATE SIDINGS TO STATIONS* ON THE SAME RAILWAY

Reference to Nos  
of services, etc.,  
in the first list

- 9 That portion of the first terminal service of railage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations, including taxes
- 10 That portion of the first terminal service of haulage which is fulfilled in relation to loaded and empty wagons during their stay in private sidings corresponding to first terminal stations.
12. First terminal service of portorage.

Traders' wagons should have the owner's name and location conspicuously painted on both sides of each wagon so as to be a guide to shunters in the process of marshalling empty wagons, and to the guards of trains engaged in the conveyance of empty wagons to their destinations.

Loaded wagons intended for private sidings should be labelled and conveyed to their destinations directly, or by a continuous process, in the same manner that loaded wagons are labelled and conveyed to stations. In the event of loaded wagons being labelled and conveyed to a station, and subsequently re-labelled and conveyed, intact, to a private siding in the vicinity, considerable expense is caused, which would be obviated if the wagons were labelled and conveyed directly from the first terminal station to the private siding. Empty wagons returning to private sidings ought, also, to be conveyed to their destinations directly. The stopping of trains and the receiving of loaded and empty wagons, for brief periods, in the sidings at intermediate stations, whether due to avoidable or unavoidable causes, occasion expense, and should be kept within the narrowest limits practicable.

The average weight of loaded and empty wagons transferred by trains, per stop, at a private siding, ought not to be less than that of loaded and empty wagons transferred, per stop, at a small goods station. The cost of stopping a train to transfer wagons is much the same in amount whether it be one wagon or a dozen wagons that are transferred. Viewed in relation to wagons transferred at small stations, or stations where there is not much traffic, the cost of each stoppage, divided by the weight of loaded and empty wagons transferred, is considerably more, per ton, than at large stations, where a greater weight of wagons, furnishing a greater divisor for the cost of each stoppage, is transferred. Only by joining all stations together and ascertaining the average weight of loaded and empty wagons transferred by trains at each stop, as a basis for the calculation of cost, is it practicable to find a means of satisfying the railway company's rightful demands, and securing, at the same time, equitable treatment for traders.

Every junction with a railway, whether formed as a means of communication with the sidings of a goods station or with a private siding, is a source of danger, as a history of railway accidents, could it be written, would show. Sidings themselves, when containing wagons, frequently become instruments undesignedly conducing to collisions and other mishaps, which, at times, endanger the passage of trains on the main line. For the sake of public safety, therefore, it is desirable that the number of junctions with any railway should not be more than are necessary, and that the establishment of a private siding in connection with a railway should be permitted only after an assurance has been given that the weight of traffic to be dealt with thereat, periodically, will not be less than a stated amount. No railway company would think of constructing a goods station in any place and providing a staff of men, unless there was a probability that the amount of traffic arising in the locality would be sufficiently large to warrant the action. Doubtless, it is convenient to traders, whether they own a large or a small business,

to have, adjacent to their works, private sidings communicating with a railway ; but when the weight of loaded and empty wagons periodically transferred at a private siding is very small, it is reasonable that the railway company should increase the charges for the terminal service of stoppage at such siding so as to be equal to the charges averagely obtained for the same service when performed at a small goods station.

In reference to private sidings, therefore, it may be made a condition that the weight of loaded and empty wagons averagely transferred by trains at each stop shall not be less than the weight of loaded and empty wagons averagely transferred, per stop, at small goods stations during a stated period, and, if the weight prove to be less, that the charges for each terminal service of stoppage shall be increased so as to make up the deficiency. In the latter contingency, the charges added would form extra charges, and would have to be calculated specially, or apart from the united rates and terminal charges.

British railways have been constructed by private individuals who have united together to form companies and provide capital for the purpose. Generally, the aim of the promoters was to make a connection between two large towns, choosing a route that would pass through, or near to, towns and villages lying between ; but before taking active steps, the sanction of Parliament had to be obtained. Their construction has been spread over a lengthened period ; one company after another having been formed at different times and in different localities, the ostensible object of each being to give to certain towns and villages the facilities afforded by a railway. This continued action has had the effect of intersecting the face of the country to such an extent as to make it appear, viewed through the medium of a map, as if covered with a network of lines. At first, two widths of railway for the passage of vehicles were made use of ; some companies adopting the broad gauge, and others, the narrow gauge, which involved the construction of vehicles having different widths between the wheels. This condition of things lasted for many years, and caused great inconvenience. Naturally, the existence of two gauges precluded union by means of junctions. Finally, the railway companies who had adopted the broad gauge abandoned it, and altered their lines so as to conform to the gauge adopted by other railway companies. With minor exceptions, the railways in Great Britain have now only one gauge, with the result that the locomotives and wagons used and owned by any railway company are enabled to travel on the railway of any other company.

Although the width and height of bridges and tunnels constructed on railways vary to some extent, giving occasion to fix different maximum dimensions of loaded wagons for different railways, the diversities are so small that they are not likely to materially affect the weights of loads,

The adoption of a uniform gauge and the close agreement of the dimensions to which loaded wagons are limited on the various railways, make it reasonable to imagine that if the values of the instruments forming the means and appliances of railway companies were equalized, the resulting averages would, in some important respects, be the same for each railway. For example, it might be expected, remembering that most kinds of commodities are carried by all railway companies, that the wagons built by the respective companies would be so much alike that their weights, averagely computed for the several divisions of traffic, would be the same, practically, for each railway. Since there is no statutory law enjoining uniformity in this particular, it is to be feared that the results of calculations would disclose considerable differences; and, if so, there is ground to believe that some companies possess greater advantages than other companies, owing to the fact that their wagons are more economically adapted to the needs of traffic.

To elucidate the subject, let it be assumed that the wagons provided by one railway company for the purpose of carrying general merchandise are longer, stronger, and heavier than those provided by another railway company. Obviously, to secure equal rates and charges, per ton, the loads carried must likewise be heavier proportionately. But a large part of general merchandise consists of consignments of many magnitudes, each less than a full load, and the wagons provided, however unsuitable, must be used to carry such consignments. It follows that the provision, by one company, of wagons whose average dimensions, strength, and weight are greater than those provided by another company, tends to increase the rates and charges, per ton, for consignments that are less than full loads, and it becomes necessary to ascertain which is the best type of structure to adopt in building wagons to carry general merchandise, or, indeed, any other description of merchandise. A test of the economic fitness of wagons for the purpose of carrying general merchandise is afforded by ascertaining the weights of loads and of wagons employed to carry them, with the respective distances conveyed, during a stated period. By means of calculations made from the resulting figures may be found the ratio of the weight of loads to the weight of wagons, conveyed one mile; and the greater the fraction expressing the ratio the greater is the benefit received. To gain the information required, a pre-arranged method of recording it in detail is necessary.

There is, however, yet another determinant, whose influence is more apparent in reference to merchandise invariably carried in full loads and in wagons built for the purpose than in regard to merchandise which comprises loads of varying magnitudes carried in wagons built for a general purpose. This determinant is the benefit derived from the greater utilization of space on the railway itself, and in the sidings at terminal stations and junctions, when longer, stronger, and heavier

wagons are provided, and proportionately heavier loads are carried. Coal furnishes a good example of merchandise affording an opportunity to gain space by increasing the weights of wagons and loads. Let it be assumed that 18 wagons, each weighing 5 tons and loaded with coal weighing 10 tons, form a train-load. Let it be granted that 15 wagons, each weighing 6 tons and loaded with coal weighing 12 tons, also form a train-load. Each train-load will weigh 270 tons. If conveyed equal distances on the same railway, the rates, per ton, will be alike; the amount received for transport will be the same for each train-load, but the space occupied on the rails by the fifteen wagons will be less than that occupied by the eighteen wagons. The reduction of space occupied, consequent on the use of larger wagons containing heavier loads, constitutes the advantage gained. The same reasoning applies to other kinds of merchandise carried under like conditions.

If railway companies build their wagons so diversely as to yield different average weights when computed for merchandise in any division of traffic, and if it could be supposed that the action has no prejudicial effect, but that each company derives equal advantages in spite of it, it might be urged that for the sake of the facilities which uniformity gives the practices, in this respect, ought to be altered so as to agree with each other. But if it can be shown, as seems likely, that dissimilar makes of wagons are immediately responsible for differences in the benefits obtained, it behoves railway companies to ascertain which structural type of wagon is best adapted to merchandise in each division of traffic, and to build their wagons conformably thereto. If the type of structure were judiciously chosen and generally adopted, the provision of the most suitable makes of wagons would have the effect of extending equal advantages to railway companies individually, and increased benefit would accrue to them collectively.

Similar reasons may be adduced in favour of uniformity in the construction of locomotives and tenders. If railway companies could be persuaded to agree on the patterns from which to mould or fashion the machinery designed to produce steam and transmit its power, and to display the same unanimity with regard to the structure of the vehicle on which the machinery and its accessories have to be borne, benefit would follow. Inventions, leading to improvements, are continually being brought forward, constraining, in many instances, those whose interests are affected, to accept and make use of them. If a committee of experts in each department of labour, representative of the united railway companies, were appointed expressly to scrutinize new inventions and ideas that claim to be amendments of existing machinery and methods, those that were deemed, by consent, to have sufficient merit, might be immediately utilized, and those whose worth the committee disagreed upon, might be subjected to experiment before further steps

were taken. Acting thus, new devices would have to undergo, preliminarily, a rigorous examination by skilled judges, and, if accepted, could be made use of by all railway companies simultaneously.

The circumstance that railways are owned by many different companies, together with the probability that some of the averages resulting from the equalization of instrumental values will not be the same for each railway, may be expected to create conditions which it will be instructive to note. Many large towns are joined together by means of two or more railways whose lengths are, usually, unequal. If, with regard to two railways of unequal length connecting together the same two towns, the equalization of instrumental values yielded the same averages; and if, consequently, the united rates and charges, per ton, for each consecutive distance were identical for both railways, the company owning the longer railway would be entitled to charge higher rates, per ton, for the whole distance, than the company owning the shorter railway. But if the equalization of instrumental values did not yield the same averages, and if, consequently, the united rates and charges, per ton, for each consecutive distance were not identical for both railways, it may be supposed that one company would still be entitled to receive greater sums, per ton, for rates and charges combined, between the same two towns, than the other company. If each company charged in accordance with its powers, or in conformity with its habitude between towns connected together by its own railway only, the company whose united rates and charges, per ton, were the lowest would, presumably, carry all the merchandise, or the bulk of it, forming the traffic between such towns, because traders would have no hesitation in choosing the cheapest means of transport. Thus the construction, by different companies, of railways joining together the same towns creates conflicting interests, since each company is compelled to strive for as much of the traffic as possible, regardless of the fact that its route may be a longer or more expensive one than that of another company.

In these circumstances it is necessary, in fairness, to permit some relaxation in the rules by agreeing that railway companies shall be authorized to lower, if they choose, the normal rates and charges between stations where competition exists, so as to coincide with the normal rates and charges between the stations of another company whose route is shorter or less expensive to work, provided that the abatements have the effect of diminishing the profit only, and do not cause actual loss. It is to be observed, however, that this action, which must be voluntary on the part of railway companies, will occasion irregularities. For instance, between stations where competition exists, the united rates and charges, per ton, would be less, when reduced for the reason stated, than between stations on the same railway where competition is absent, although the distances between the former stations would be greater

than the distances between the latter stations. To solve the difficulty with any approach to justice by any other course of procedure than the one indicated, seems to be impossible; and to prohibit railway companies from lowering their rates and charges in the circumstances stated would be injurious to the companies themselves, by depriving them of a share in the conveyance of merchandise between certain towns, without yielding the least benefit to traders.

In a great many instances, traders require to send goods to other traders who are located in distant towns and villages, and two or more railways have to be made use of, in continuous succession, to effect transport. When two railway companies are together employed to convey merchandise under ordinary conditions, either company may supply wagons, and each company provides a terminal station and fulfils terminal services. In addition, the two companies mutually transfer loaded and empty wagons at appointed interjunctions, where preparation has been made for their reception and temporary retainment. The transfer of wagons by one railway company to another railway company at an interjunction, implies the performance of services that correspond with junctional services. Junctional services, when performed at all, are fulfilled in relation to the minor part of all traffic dealt with by a railway company, but interjunctional services are performed in relation to the whole, or a large part, of the traffic shared by two or more railway companies. It is only when a railway company has been invested with running powers on the railway, or a part of the railway, of another company, that its trains are enabled to convey wagons from first to second terminal stations without transferring them at the place where the two railways meet, and where transfer would, ordinarily, take place. With this exception, interjunctional services relating to merchandise of every description conveyed by two railway companies, conjointly, are performed by each company.

When more than two railway companies are employed unitedly, to convey merchandise, only the first and last company perform terminal services, the remaining company or companies, as the case may be, becoming intermediate carriers. The duty of each intermediate carrier is to receive wagons from one company, and, after conveyance on its own section of railway, deliver them to another company. By this procedure, the intermediate carrier performs interjunctional services at each end of the section.

In order that wagons may be transferred from one company to another company promptly, and with the least expense, it is the duty of each company to facilitate operations by providing suitable sidings adjacent to the interjunctions where transfer is to take place.

When merchandise is conveyed by two railway companies conjointly, and wagons, provided by either of the two companies, are transferred

by one railway company to the other railway company at an interjunction, in addition to ordinary services, etc., the following services, etc., are fulfilled by the two companies concerned —

First interjunctional service of railage, including taxes.	} Constituting the first interjunctional service of stoppage.
First interjunctional service of haulage.	
First interjunctional service of truckage relating to locomotives, etc.	
First interjunctional service of truckage relating to loaded and empty wagons	
Interjunctional service of railage relating to loaded and empty wagons while staying in the sidings of the first railway company, at an interjunction, including taxes	
Interjunctional service of haulage relating to loaded and empty wagons while staying in the sidings of the first railway company, at an interjunction	
Interjunctional service of truckage relating to loaded and empty wagons while staying in the sidings of the first railway company, at an interjunction.	
Interjunctional service of railage relating to loaded and empty wagons while staying in the sidings of the second railway company, at an interjunction, including taxes.	
Interjunctional service of haulage relating to loaded and empty wagons while staying in the sidings of the second railway company, at an interjunction	
Interjunctional service of truckage relating to loaded and empty wagons while staying in the sidings of the second railway company, at an interjunction.	
Second interjunctional service of railage, including taxes.	} Constituting the second interjunctional service of stoppage.
Second interjunctional service of haulage.	
Second interjunctional service of truckage relating to locomotives, etc.	
Second interjunctional service of truckage relating to loaded and empty wagons.	

When three railway companies are jointly employed to convey merchandise, and wagons, provided by one or other of the three companies, are transferred by the first to the second company, and by the second to the third company, at successive interjunctions, the services, etc., mentioned above, are fulfilled by two of the three companies at each interjunction, and so when more than three railway companies are jointly employed to convey merchandise. It is to be noted that the company providing wagons to carry merchandise is entitled to the whole of the charges for the services of truckage rendered in relation to such wagons.



The calculation of charges for interterminal, terminal, junctional, and interjunctional services, and for liabilities and obligations, must relate to services actually performed, and to liabilities and obligations actually undertaken, by a railway company or by two or more railway companies combined. The fulfilment of any service or the acceptance of any obligation by traders has the effect of annulling the charges for such service or obligation that would otherwise be receivable by the railway company or companies concerned, and, at the same time, necessitates the preparation of a Table of United Rates and Charges adapted to the altered conditions.

After being discharged at stations on the owning company's railway, wagons used to carry general merchandise may be reloaded and sent to stations either on the same or on another railway. This liberty of action tends to diminish the number of wagons that require to be conveyed, empty, after having carried general merchandise. But when loaded wagons are forwarded to stations on another railway and are discharged, it becomes necessary to return them to the owning company within a reasonable time. To secure the fulfilment of this duty, railway companies unite to make regulations, to be observed by each company, fixing, for stated distances, periods of time allowed for journeys of wagons outward and inward—including time for unloading—on railways other than the railway of the owning company, fines being imposed for infringements of rules. One of the prescribed conditions is that wagons returning to the parent railway must travel by the same route that was taken on the outward journey, unless a shorter route that is unobjectionable be available. When opportunity offers, returning wagons may be reloaded with general merchandise consigned to stations on the owning company's railway, but not to other stations, and they must not be retained awaiting such consignments. Since each railway company undertakes to provide wagons for carrying general merchandise on its own system, it is reasonable that when merchandise is consigned to stations on other systems, the wagons carrying it should be returned to the owning company without unnecessary delay. The result of this arrangement, however, is disadvantageous in one important respect. Consequent on the restrictive character of the rules referred to, the number of wagons returned, empty, after having carried general merchandise, is materially increased. Hence, the increased weight of empty wagons conveyed, added to the performance of interjunctional services, augments the cost of transport, and tends to impair the ability of railway companies to compete, unitedly, with single companies for traffic such as general merchandise.

The preceding remarks apply also to wagons containing live stock conveyed under the same conditions.

Wagons used to carry articles of uncommon weight or dimensions,

or of great length, or merchandise such as coal, lime, etc., and conveyed from stations or private sidings on one railway to stations or private sidings on another railway, after being discharged are usually conveyed, empty, to stations or private sidings on the parent railway. This procedure corresponds with that followed with regard to wagons containing similar kinds of merchandise that are conveyed from stations or private sidings on one railway to stations or private sidings on the same railway, and, consequently, the weight of each loaded wagon, apart from the load, requires to be doubled or greatly increased, in either event, in order that the conveyance of empty wagons may be included in the calculation of cost.

When two or more railways are connectedly made use of for the transport of merchandise, it is desirable that the rates and charges due to each railway company should be joined together to form united rates and charges, calculated for the whole distance conveyed. To compute, with respect to each consignment of merchandise, the amount payable to each railway company, making separate entries in the invoice, would be a troublesome task. It is at this juncture that the identity or similarity of equalized instrumental values facilitates procedure. At the outset it may be admitted that these values will not be the same in every respect, in all cases. For instance, the average cost per mile of railway, and the mean ascending gradient, cannot be alike for all railways, because these matters depend on circumstances that are only partially controllable by railway companies. But with regard to locomotives and wagons there seems to be no sufficient reason why their average weights, taking all railways separately into account, should vary to any great extent. On economic grounds, it is the duty of each railway company to construct the most suitable locomotives and wagons to work with that can be devised, and if this be done there is reason to believe that the average weights of these instruments will closely agree for all railways. The average lengths of time required for the stay of wagons at terminal stations for the purposes of loading, unloading, and despatch; and for their stay, when necessary, at junctions and other places of transfer, before arriving at their destinations, ought to be the same for all railways. The agreement of other average values may also be counted on. Although it cannot be expected that the equalization of instrumental values will yield identical results for each railway, it is desirable that they should do so in as many points as possible. Consequent on these agreements which it is the manifest duty of railway companies to foster, the union of rates and charges for merchandise conveyed by two or more railway companies, in conjunction, will be simplified.

When two railway companies are employed, conjointly, to convey merchandise, Tables of Rates and Charges differing from those applying

to merchandise conveyed by the two companies, singly, will need to be prepared for the several divisions of traffic. Each company will be entitled to rates, per ton, for consecutive distances that are multiples of the initial distance deemed to be appropriate for such company's railway. If the initial distance be the same for each railway, one column of consecutive distances will suffice for each Table, if it be different, two columns of suitable consecutive distances will be requisite for each Table.

The respective distances between an interjunction and the stations on either of the two railways, meeting at the interjunction being known, the distances between stations on one of the two railways and stations on the other railway may be easily ascertained. Let it be assumed that the distance between a station on one railway and a station on another railway is 50 miles; and let it be supposed that the distance between the first station and the interjunction where the two railways meet is 20 miles, and between the interjunction and the second station, 30 miles. The scale of rates appropriate for 20 miles will apply to merchandise conveyed on the first railway, and the scale of rates appropriate for 30 miles—beginning at 20 miles, or at the scale of rates appropriate for 20 miles—in the other column of consecutive distances, if two columns be necessary, will apply to merchandise conveyed the whole distance of 50 miles, the difference between the two scales of rates indicating the rates for conveyance on the second railway. The rates due to each company will be the same whether merchandise is conveyed in one direction or in the other.

In the circumstances supposed, either of the two railway companies may provide wagons, and, of course, the one doing so will be entitled to that portion of the rate calculated for the interterminal service of truckage relating to wagons. Each company will provide a terminal station at which first or second terminal services will be performed according to the direction in which merchandise is conveyed. Each company will be entitled to charges for the terminal and junctional services which it performs, corresponding with those calculated for the same services fulfilled in relation to merchandise dealt with at terminal stations and junctions on its own system. Charges for the terminal and junctional services of truckage will be due to the company that provides wagons. In addition, each company will perform the interjunctional services of stoppage, railage, and haulage, and the company providing wagons will render the whole of the interjunctional services of truckage relating to such wagons. Charges for the interjunctional services performed by each company will need to be added to the ordinary charges for terminal and other services fulfilled by the same company, so that when two companies are jointly employed in the

transport of merchandise, the charges due to each company, whichever of the two companies provides wagons, will be readily distinguishable.

Therefore, in preparing a Table of Rates and Charges, applicable to any description of merchandise conveyed by two railway companies, conjointly, the charges calculated for terminal, junctional, and inter-junctional services, and for liabilities and obligations, fulfilled or undertaken by each of the two railway companies, must be added together and joined to the unaltered scales of rates which will refer to the same or to different consecutive distances, as may be considered appropriate for each railway.

The employment of another company, in addition to two companies, as a participant in any act of conveyance, ordinarily occasions a repetition of interjunctional services and requires the computation of charges for their performance. Consequently, when three or more railway companies are jointly employed to convey merchandise, additional Tables of Rates and Charges will have to be prepared to accord with the altered conditions, in each case, but the procedure will be similar to that described in regard to two companies.

It is a matter of importance to traders that the rates and charges due to each of a number of railway companies jointly employed to convey merchandise, should be added together to form united rates and charges, per ton of load, for the whole distance conveyed, and it is equally important that the amounts due to each of the railway companies, so employed, for the various services which it performs, should be clearly indicated. These objects can be attained without much difficulty, if the averages resulting from the equalization of instrumental values be favourable.

In the returns furnished by the Board of Trade, the total weight of all kinds of merchandise, except live stock (which is not given), carried on all railways in the United Kingdom during the year 1906 is stated to be 488,790,683 tons. The weights of wagons and locomotives employed in the conveyance of this merchandise are not recorded, because railway companies, not being sufficiently aware of its importance, have paid little heed to the matter. The weight of wagons, with their accessories, repeatedly made use of to carry merchandise, including the weight of empty wagons conveyed, may be estimated as being equal, at least, to the weight of merchandise conveyed, and the weight of locomotives, tenders, and brake-vans, with their accessories, repeatedly employed in the haulage of trains, may be set down, roughly, as also being equal to the weight of merchandise conveyed. In round numbers, therefore, the respective weights of merchandise, wagons, and instruments of power, may be stated as follows.—

Tons 488,790,683	Weight of merchandise conveyed on all railways in the United Kingdom in the year 1906.
488,790,683	Weight of wagons employed to carry merchandise, including empty wagons, conveyed on all railways in the United Kingdom in the year 1906.
488,790,683.	Weight of locomotives and their accessories, employed to haul trains, conveyed on all railways in the United Kingdom in the year 1906.

Assuming that the proportions remain the same, year by year, one-third, roughly estimated, of the total weight of trains of merchandise annually conveyed on all railways in the United Kingdom, is attributable to merchandise forming the loads; one-third to wagons carrying the loads and to empty wagons, including their accessories, and one-third to locomotives and their accessories, forming the instruments of power.

Merchandise carried on railways consists of hundreds of thousands of consignments, differing in magnitude, provided by traders located in every town and village, and constitutes a large part of the internal commerce of the country. It is necessary to separate it into divisions of traffic, partly because of well-marked distinctions in the kinds of which it is composed, partly because the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed the same distance, is not alike for each description of merchandise, and partly for other reasons. Many railway companies are employed to convey merchandise, each company having its own sphere of action and, in addition, frequently serving large towns in competition with other companies.

The weights of consignments tendered by traders to each railway company for conveyance, vary, day by day. Yet they are ascertained and recorded, though it might be considered a task of difficulty. The weights of wagons and instruments of power used in the conveyance of merchandise on each railway are constant—except as they are affected by the weather and the slow process of wear—and might be ascertained and recorded with comparative ease. The conveyance of instrumental machinery occasions the same expense, ton for ton, as that of merchandise. The power of steam is exerted to move a locomotive, wagons, and loads, forming a train, in proportion to their individual weights, or the separately measured force of gravitation. Consequently, in order that the cost of conveying merchandise may be correctly ascertained, the cost of conveying locomotives and wagons must form a part of the calculation.

Although the weights of wagons and locomotives may be regarded as constant, it must be remembered that they differ, more or less, from each other, according to the purposes for which the instruments are

designed. Seeing that the united weights of loads and wagons, forming train-loads, joined with the weights of the instruments of power, are variable, it is impracticable to calculate the cost of conveying loads joined with wagons and instruments of power, according to the relative magnitudes of their weights, in each instance. But if it were possible to do so, it would be undesirable to establish varying rates, per ton, for the same kind and quantity of merchandise, conveyed the same distance, to harmonize with constantly changing conditions.

The leading features of the method may be described as follows —

1. The equalization of instrumental values.
2. The separation of merchandise into divisions of traffic
3. The merging of the cost of conveying the instruments of power in the cost of conveying train-loads, by suitably increasing the sum employed as a factor with the weights of loads and wagons to compute rates for conveyance.
4. The recording of the weights of loaded wagons and empty wagons, with the respective distances conveyed, in order that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed the same distance, may be ascertained for each division of traffic affected by it.
5. The creation of grades for each division of traffic requiring the procedure, by employing a series of weights of loads for the purpose of distinguishing them, each weight of load employed to mark a grade being joined with an average weight of wagon and a proportionate part of the weight of empty wagons conveyed.
6. The computation of weights of wagons proportionate to unit-weights of loads, relatively corresponding to the weights of wagons individually joined with the weights of loads employed to distinguish the grades.
7. The employment of sums as factors with the unit-weights of loads and proportionate weights of wagons to compute rates for conveyance and charges for terminal, junctional, and interjunctional services, and for liabilities and obligations, relating to merchandise comprised in each division of traffic.
8. The arrangement to allow the scales of rates to remain permanently unchanged, and to increase or decrease the amounts chargeable for conveyance by altering the initial and consecutive distances to which the scales of rates refer.
9. The preparation of Tables of United Rates and Charges, per ton of load, for consecutive distances, applicable to merchandise comprised in the several divisions of traffic, according to the conditions of conveyance.
10. The calculation of amounts, per distinguishing weight of load, for consecutive distances, relating to merchandise in each division of

traffic for which the procedure is feasible ; the respective amounts being entered, in each Table, in proximity to the united rates and charges, per ton, by means of which they have been calculated.

11. The ascertainment, when practicable, of the weights of full loads averagely obtained from the different kinds of merchandise in each division of traffic, in order that the grade for full loads of each kind may be correctly indicated

12. The intimation that the weights of consignments of merchandise that fall short of full loads are to be individually approximated to the weights of loads employed to distinguish grades succeeding the grades for full loads ; and that the amounts chargeable for the transport of such consignments when their weights come between the weights of loads employed to distinguish adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, so long as the amounts yielded do not exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads, since it would be absurd to charge a larger amount for a less load than for a greater.

By the method proposed it will be impossible to make partial changes in the rates and charges without the fact being clearly perceived. Individual traders, therefore, cannot receive preferential treatment without open disregard of equity. But between towns that are served by two or more railway companies, the companies having the longer routes may find it advisable to adopt the rates and charges of the company whose route is the shortest or cheapest, in order to participate in the traffic. This action is allowable so long as it is not inimical to the interests of traders, and is confined within reasonable limits ; but it should be quite voluntary. Other causes might render it expedient for a railway company to deviate, on occasion, from its normal rates and charges, but no alteration should be suffered to take place without authoritative permission, given with full knowledge of the circumstances justifying it. It is of great importance that traders should pay sums for transport proportionate to the services rendered, whenever possible, for by no other means can the rates and charges, as a whole, be maintained at the lowest point, and, at the same time, yield a sufficient return on the capital of railway companies. Moreover, equality of treatment affords the best guarantee that the rates and charges will be reasonable in amount, for, should they be equal and yet too high, traders will suffer alike and have equal cause to be dissatisfied. Railway companies are more quickly induced to give relief when complaint is general.

When wagons are fully loaded, the cost, per ton, is at the lowest point with regard to the kind of merchandise forming the loads, and,

consequently, the rates and charges, per ton of load, will be correspondingly low. It follows that the rates and charges, per ton, for loads that are less than full loads, must be higher than those for full loads, because of the resulting greater proportionate weight of wagon to ton of load. For this reason, rates and charges, per ton, must vary, in agreement with the magnitudes of loads. The method recognizes this truth, and it is in accordance with the fitness of things that traders should pay lower rates and charges, per ton, when they provide larger consignments of merchandise, and higher rates and charges, per ton, when they provide smaller consignments. The lessened expense resulting from heavier loads enables a railway company to reduce its rates and charges, per ton, correspondently, and this reduction constitutes the incentive requisite to induce traders to increase the magnitudes of consignments.

It is assumed that railway companies will be required to publish, and offer for sale, Tables of Actual Rates and Charges, per ton of load, for consecutive distances, applicable to merchandise in the several divisions of traffic. A list of the articles of merchandise proper thereto should accompany each Table, together with instructions and information that may be requisite for the guidance of traders. Different Tables of Rates and Charges will be necessary, according as merchandise is conveyed by one railway company or by two or more railway companies, conjointly. Since traders will wish to know the rates and charges, per ton of load, between given stations or private sidings and other stations and private sidings, it will be needful to provide books, also to be offered for sale, showing the distances between given stations or private sidings and other stations and private sidings, together with the Nos. of Tables prepared for the several divisions of traffic, and the No or Nos. of the scales of united rates and charges in each Table, applicable to merchandise conveyed between each two connected places, whether stations or private sidings. The Tables of Rates and Charges and the books, prepared in the manner described, will prove to be of great use to traders in the transaction of business, and will be indispensable to railway clerks in the performance of their duties.

It will also be necessary for the legislature to authorize the preparation of Tables of Maximum Rates and Charges for merchandise in the several divisions of traffic, appropriate for each railway company. The initial distance and consecutive distances prefixed to the scales of rates in each Table should be somewhat less than the distances considered to be necessary in practice; and the several sums employed as factors with the unit-weights of loads and proportionate weights of wagons to compute charges for terminal and other services, should be somewhat greater than the sums that are expected to be actually employed. This procedure will give to each railway company a reasonable amount of freedom to alter, should circumstances require it, the



distances prefixed to the scales of rates in practice, or the sums actually employed as factors with the unit-weights of loads and proportionate weights of wagons to compute charges for terminal and other services. The Tables will correspond, in form, with those in actual use, but the calculations will be on a rather higher basis. The Tables, and the alphabetical lists of merchandise to which they respectively relate, with instructions as to the grading of consignments, including all magnitudes, together with a notification of the minimum charges for light consignments of general merchandise in the first and second divisions of traffic, and other relevant information, should be contained in each enactment.

The Tables of Maximum Rates and Charges thus prepared, applicable to merchandise comprised in the several divisions of traffic when conveyed by each railway company on its own system, assumed to be authorized by Parliament, will continue their function of limiting the rates and charges due to each company when two or more railway companies are jointly engaged in the transport of merchandise. Hence there will be no occasion to establish additional Tables of Maximum Rates and Charges to apply to merchandise when conveyed by two or more railway companies, conjointly.

A railway, perfectly equipped in all respects, may be considered to be a machine constructed for the purpose of transporting merchandise as one of its chief objects. The weight of merchandise, or the measured force of gravitation, is the power contended with in the act of transport, and forms, therefore, the proper subject for the calculation of cost. To convey merchandise, however, wagons and instruments of power are needed, and they, too, have the property of weight. Consequently, the weights of merchandise, wagons, and instruments of power, must be severally taken into account in computing the cost of transport. Companies, having furnished capital to enable them to become railway carriers, naturally expect to be adequately recompensed for the outlay. On the other hand, traders, who provide the merchandise to be carried, are justified in asking that the rates and charges which they are called on to pay shall be cast impartially. It seems impossible that two different methods of arriving at equitable rates and charges, each giving different results, can exist. It may be difficult to compute them so as to exactly accord with services rendered, but the manner of procedure, with that object in view, ought to be the same for all railways in all countries.

It is claimed that the method of calculating and establishing rates and charges for merchandise carried on railways, described in the preceding pages, marks out the true and only manner of procedure whereby the respective rights of railway companies and traders can be efficiently protected.

# PART III

## THE METHOD ILLUSTRATED BY EXAMPLES

### CHAPTER I

#### RAILWAY, MOTIVE-POWER, AND WAGONS—INTERTERMINAL SERVICES OF RAILAGE, HAULAGE, AND TRUCKAGE

IT must be distinctly understood that the figures employed in the following pages, whether relating to weights, ratios, periods of time, sums of money, or other denominators of value, are intended to show the method of procedure in arriving at equitable rates and charges, and have no further significance. Other figures might be substituted, but the method would remain the same.

For the conveyance of all kinds of merchandise three things are necessary—a way, a vehicle, and a motive-power. The way and the vehicle are combined in one when a raft of timber floats down a river, gravitation being the motive-power. The motive-power and the vehicle are united when an animal carries a burden. Generally, the three requirements exist apart.

*Railway.*—For the construction of a railway strips of land must be bought, having a total length commensurate with the length of the intended railway. The prices vary, depending on the situation, the purposes for which the land is being used, and other reasons. The land thus acquired needs surveying, excavating, embanking, bridging, tunnelling, levelling, fencing, etc. The cost of shaping the way depends on the nature and conformation of the land. Rocky ground, valleys, and hills, form obstacles to be surmounted, and add great expense to certain sections, while other parts of the way are constructed at a moderate cost. When the surface has been suitably prepared, sleepers or supports are embedded in the ground, upon which two parallel lines of iron rails, placed end to end, are securely fixed. The permanent way is then completed. Two lines of rails form a single railway, and four lines a double railway.

The cost of laying the rails on straight sections is, probably, uniform for equal distances. Curves add to expense. Signals, and signal-boxes containing the apparatus for working them, are erected at convenient intervals along the railway. When finished, some sections of the railway will have cost more, per mile, than other sections. By dividing

the total cost by the total number of miles of railway constructed, the average cost per mile of railway is obtained.

A goods train is separable into two parts, firstly, a locomotive, tender, and brake-van, constituting the instruments of power, and secondly, a number of wagons, loaded or empty, forming the train-load. The pressure, or the weight of the train upon the rails during transit from one station to another, is a definite measure of the work accomplished by the agency of the railway. This work may be called the interterminal service of railage.

In computing the cost of the interterminal service of railage or the use of a railway, the expenses to be taken into account are as follows —

1. Wages and salaries of platelayers, foremen, and superintendents
2. Wages and salaries of signalmen, pointsmen, and superintendents.
3. Consumption of stores, as oil, gas, coal, etc.
4. Incidental repairs of railway, structures, apparatus, etc, due to wear.
5. Allowance for the relaying of rails, sleepers, etc, the rebuilding of structures, and the replacing of apparatus, etc, when worn-out or when deemed necessary (Depreciation of railway).
6. Taxes.

In addition, provision must be made for profit on the capital invested in the railway.

The cost of rails, sleepers, etc, required for each railway, is probably alike, or nearly so, but the prices paid for land, and the natural difficulties to be surmounted in preparing it for its designed purpose, may be expected to differ. Consequently, the average cost, per mile, of one railway may greatly exceed that of another.

It may be assumed that the working expenses of a railway having a small amount of traffic will be proportionately greater than those of a railway having a larger amount of traffic.

*Motive-power*—The haulage of vehicles on a railway is performed by means of locomotive steam-engines. The configuration of the land often requires that some parts of the line should be inclined. The degree of inclination must not be great, because the tractive power of the engine is greatly relaxed in the act of ascending. It may be presumed that each railway consists of level sections and sections that are inclined, with different degrees of inclination. Trains are conveyed in both directions, their passage comprising ascents, descents, and procedure on level courses. The power of the locomotive is best utilized on level and straight sections of railway. To haul trains on ascending gradients naturally demands a greater expenditure of power than to move them on level sections. As some compensation for rising gradients, steam is saved on descending gradients, but, to prevent accidents, great care is needed to check trains when moving by the force of gravity. While long and heavy trains are easily controlled on level sections, their

management becomes more difficult on descending inclines, especially where the gradients are steep.

It may be assumed, taking both up and down directions into account, that the lowest cost or most economical expenditure of steam-power occurs on level and straight sections of railway, and the highest cost on sections having the steepest gradients. With the object of averaging the cost of steam-power, in either direction, over the whole of a railway, it is requisite to take into account the angles and lengths of the inclines, together with the dimensions of curves, and the lengths of level sections, and to calculate a mean ascending incline, corrective of levels, differing gradients, and curves. By this procedure, the cost of steam-power may be computed as if trains were continually ascending a fixed incline.

Trains vary in weight, and travel at different speeds. Heavily loaded trains are precluded from travelling very fast, either on ascending or descending gradients, while lightly loaded trains may proceed more quickly. The extent of load, and the successive deflections of track during the course of transit, individually influence the speed of trains. Trains differ in weight owing to various causes. Traffic ebbs and flows, and, whether of large or small amount, demands daily attention. Goods trains are timed to run, daily, in each direction, some to stop at many stations during a journey, and others to travel long distances before stopping. When a train has completed a journey, the locomotive, tender, and brake-van are attached to a fresh train, and a return journey is commenced. In the course of these journeys, wagons, loaded or empty as the case may be, are attached and detached at stations, according to requirements, the loading of the trains being governed by the amount and description of the merchandise presented, daily, for conveyance.

In the course of a day's work, a locomotive and its staff, appointed to convey trains, cannot always be engaged in the performance of the duty designated; in reality, a considerable part of the time is spent otherwise. It will be instructive to mention some of the duties that need to be discharged. To commence with, a supply of fuel and water has to be obtained, a fire has to be lighted, and steam raised to a given pressure in the boiler of the engine, the bearings of the engine have to be oiled, and the important parts of the machinery inspected, sometimes, a turn-table has to be used for reversing the engine and tender; and, when these preparatory duties have been accomplished, the instruments of power need to be moved from the locomotive sidings on to the main line and to the precincts of the station where the first journey begins. During a journey, stoppages may occur to take in a fresh supply of fuel or water, or because the line is blocked; or it may be necessary to shunt the train from one line of rails to another to let a quicker or more important train pass. At the end of a journey, it is requisite for the

engine and tender to be again reversed, and to prepare for the return journey. To complete the day's work, the locomotive has to be moved to the engine-shed, cleaned, and again made ready for use.

When a driver, fireman, and guard come on duty, their wages begin and continue uniformly to the conclusion of the day's work. A part or the whole of the machinery of a locomotive is always being used from the lighting of the fire to its extinguishment. Steam is constantly being expended either by direct use or by the radiation of heat. The rails of sidings and of the main line are occupied alternately, and, before the latter can be entered on, certain duties have to be performed by signalmen, whose attention is engaged during the whole of the time that the locomotive, with or without its train, occupies the main line. A stopped locomotive or train on a main line causes greater solicitude to signalmen than one normally moving.

It is important that the various duties rendered apart from the haulage of trains, yet indispensable to the performance of that service or unavoidable, and which may be described as suppletive duties or services, should be carefully noted, so that they may be adequately provided for in the computation of cost.

The haulage of trains is affected by the weather. In winter, especially during a period of frost and snow, the service is more expensive than in other seasons. The axles of wagons revolve less easily during frosty weather, and falls of snow frequently impede the progress of trains. Also, rain adds considerably to the weights of trains, saturating the wagons and their contents when exposed, and lodging in the hollows of tarpaulins when the loads are covered. Under certain conditions, rain lessens the friction of the locomotive driving-wheels on the rails by making the latter slippery. Fog tends to delay the movements of trains, causing the working-time of the staff, and consequently the amount of wages paid, to be increased. It is just, therefore, that the effect of meteorological changes should receive due consideration in calculating the cost of the service of haulage.

The weight of a train consisting of loaded or empty wagons, forming the train-load, and a locomotive, tender, and brake-van, with their accessories, forming the instruments of power, placed in charge of a staff of men, and conveyed a stated distance, or from one station to another, is a definite measure of the work accomplished by the agency of steam-power and machinery controlled by skilled individuals. This work may be called the interterminal service of haulage.

For the purpose of obtaining needful information, the guard of each train should keep a record of the day's time and the manner of spending it. The record should give the weight of the locomotive, tender, and brake-van, the varying weights of the train-loads, the number of miles the train-loads are severally conveyed, the time occupied in travelling

(speed of trains); the time spent in stopping at each station or private siding to attach and detach wagons, the number and weight of loaded and empty wagons attached and detached at each stop, and the particulars of the time expended in the performance of other duties, customary or incidental

Calculations periodically made from the whole of the returns will give the average weight of a locomotive, tender, and brake-van, employed as instruments of power to convey trains; the average weight of loaded and empty wagons forming a train-load, the average time taken by trains in travelling to their destinations (speed of trains), the average length of time required to attach and detach wagons at each stop at a station or private siding; the average number and weight of loaded and empty wagons attached and detached at each stop, and other material information

In computing the cost of the interterminal service of haulage, or the use of steam-power and locomotive machinery in the conveyance of trains, the expenses to be taken into account are as follows —

1. Wages and salaries of drivers, firemen, engine-cleaners, and superintendents.
2. Wages and salaries of guards and superintendents
3. Consumption of fuel and water in the production of steam.
4. Consumption of stores, as oil, tallow, waste, etc.
5. Incidental repairs of locomotives, tenders, brake-vans, structures etc., due to wear.
6. Allowance for the replacement of locomotives, tenders, and brake-vans, and for the rebuilding of structures, when worn-out or when deemed necessary (Depreciation of locomotive machinery used to convey trains).
7. Suppletive services.
8. Changes of weather

In addition, provision must be made for profit on the capital invested in locomotive machinery used to convey trains.

*Wagons.*—A wagon is separable into two parts, namely, the lower structure or carrying part, and the upper structure or receptacle for the load; both parts being firmly and permanently united. The lower structure consists of wheels, axles, springs, etc, and the framework necessary to hold them in position, together with buffers, hooks, and chains for protective contact with, and attachment to, other wagons. In the construction of the upper parts of wagons, regard has to be paid to the kind of merchandise which the vehicles are intended to carry, with a view to economize structural materials, and obtain sufficient stowing space. The nature, shape, and bulk of merchandise comprised in each division of traffic, and the circumstance that it is always or not always, as the case may be, consigned in full loads, have to be separately considered in deciding whether the upper parts of wagons are to have

one or more than one form. Taking all the divisions of traffic into account, the upper structures of wagons vary greatly. Some consist of a floor or platform without sides, others of a floor with low sides or with high sides, culminating in vans, each of which has a floor, high sides, and a roof, forming a chamber wherein to stow the load.

The lower structure of a wagon is a carrying machine possessing a certain power. The upper structure, whatever may be its extent, has to be carried as well as the load. Consequently, the strength of a wagon is lessened, applied to the load, by the weight of the upper structure.

Wagons are constructed so as to possess greater powers than are needed for the maximum weights of loads which they are respectively registered to carry, in order that they may have a reserve of strength sufficient to endure the jerks and concussions attending the starting and stopping of trains, and the strain on the mechanism when travelling under load at high rates of speed. The havoc that may ensue from the break-down of a wagon when forming part of a train in rapid motion renders this provision necessary. For the sake of safety, all wagons should have a considerable margin of strength when fully loaded.

Every wagon has the tare painted on it. It also bears a plate signifying the maximum weight of load which it is registered to carry, and is numbered for the purpose of identification.

The principal railways in Great Britain have now the same gauge; the distance between the two lines of rails being 4 feet 8½ inches. Uniformity of gauge enables the wagons running on each railway to travel on every other railway, and affords great convenience for the conveyance of what is termed *through* traffic, or the transit of merchandise from a station on one railway to a station on another railway, without change of wagon.

The maximum width and height of loaded wagons are regulated, in a great measure, by the gauge of the railway taken in conjunction with the maximum rate of speed of trains when passing over curved sections. Other considerations contribute to determine these dimensions, which are not quite alike for all railways, each company defining them for its own system. Bridges and tunnels, therefore, are constructed on each railway so as to provide an admeasured space for passage, and, necessarily, the width and height of loaded wagons are restricted to specified measurements. The length of wagons is undetermined, although to enable them to travel on curved sections they must either be limited in length or built with mechanical contrivances for turning. While, therefore, the width and height of loaded wagons may not exceed certain limits, the length is left undefined; yet, for the purpose of carrying merchandise, generally, the lengths of wagons do not differ greatly.

The use or wear of a wagon, including its accessories, is determined by its own weight, added to the weight of the load which it carries. As

the pressure or weight of a loaded wagon travelling on a railway measures the wear of the latter, or the work done by its means, so it must be assumed that the same pressure or weight measures the wear of the vehicle, or the work accomplished by it. When travelling empty, its own weight tends to impair the wagon, for it is reasonable to suppose that the continual haulage of empty wagons will wear them out—not so soon, but with as much certainty as if they were loaded. It may be concluded, therefore, that when a wagon carries its maximum weight of load it deteriorates the most, and when empty wears the least; or, that the impairment is in proportion to the weight upon the rails. The use or the wear of a wagon, loaded or empty, with its accessories, during the process of conveyance from one station to another may be called the interterminal service of truckage.

The lower structures of locomotives, tenders, and brake-vans must be viewed as vehicles carrying loads, the locomotive machinery, fuel, water, etc., being carried on wheeled structures in the same manner that loads of merchandise are carried on wagons. It is, therefore, appropriate that these vehicles should be joined to wagons as serving analogous purposes, and occasioning expense of an identical character.

A considerable portion of general merchandise requires protection from the weather. Vans sufficiently afford this security, and, when they can be locked, are suitable vehicles in which to convey valuable merchandise of a portable character. They are, however, not well-adapted for the stowing of long and bulky articles. The doors are somewhat narrow, and the ingress of certain kinds of goods is either difficult or impossible. Also, the upper structures of vans are in excess for small loads and such as are less than full loads. In these circumstances they are only partially occupied, and frequently much of the stowing space is unutilized. For economic reasons, a large number of wagons are built with low sides, or with a small amount of upper structure, and tarpaulins, or sheets of tanned canvas, are used as substitutes for sides and roofs of wood and iron, both for binding the loads and shielding them from the weather.

An ordinary tarpaulin has an area somewhat larger than the roof of a van, and weighs rather less than 1 cwt. When substituted for a corresponding area of solid structure, a twofold advantage is obtained. Firstly, the diminished upper structure occasions a reduced weight of wagon, and, secondly, the carrying power of the wagon applies to an increased maximum weight of load; the increase corresponding to the decrease of the weight of the upper structure. To set against this double gain, tarpaulins are more valuable, weight for weight, than the sides and roofs of vans, are easily and often damaged, and their term of serviceable existence is shorter than that of the harder structures for which they are substituted. Probably the chief advantage which



railway companies derive from the use of tarpaulins is the convenience with which open trucks can, with their aid, be turned into covered wagons, the loads being enclosed as effectually as if in vans. Open trucks, with the means for changing them at will into covered wagons, afford greater facilities for the stowing of most kinds of merchandise than are offered by vans, with the result that the operations of loading, unloading, and conveying take place more conveniently and economically.

The use of tarpaulins alternates with that of solid structure. The same kind of goods may be stowed in an open waggon, and covered with one or more tarpaulins, or stowed in a van, according to circumstances; convenience and the availableness of vehicles influencing the action. When binding and covering loads, tarpaulins must be viewed as forming parts of wagons, replacing materials of wood and iron, and it will be expedient to estimate and express their value, as compared with that of solid structure, in terms of weight of solid structure. That is to say, the values of both kinds of material, when used for a common purpose, may be deemed to have an average value which may be expressed by means of weight of solid structure.

In determining the weight of solid structure which is to be the equivalent for a tarpaulin used as a cover, it must be borne in mind that the upper structures of wagons are weighty, and that their conveyance involves charges of some magnitude for the services of railage and haulage as well as charges for their use as component parts of wagons. On the other hand, tarpaulins are light, and consequently, when covering loads, the cost of the services of railage and haulage, occasioned by their conveyance, is correspondingly small, and yet, by reason of their expensiveness and liability to damage, comparatively high charges are requisite for their use as covers. Besides, at stations where more tarpaulins are received than are required for daily purposes, those that are in excess have to be folded and conveyed in wagons to stations where there is a deficiency, which adds materially to the services of railage, haulage, and truckage, rendered in relation to tarpaulins. It is, therefore, needful to carefully consider the respective advantages and disadvantages accruing from the alternate use of these two materials for the same purpose, in order that the weight of solid structure, to be regarded as an equivalent for a tarpaulin used as a cover, may be correctly estimated.

Ropes, chains, and other accessories, used to bind loads or contribute to their protection during transit, must be assumed to constitute a part of the wagons which they accompany. Consequently, it will be expedient that their values should be expressed in terms of weight of solid structure, in the manner described with regard to tarpaulins, and that the weights of wagons should be increased so as to include loose

articles, made of various materials, used to bind and protect loads in the course of conveyance. Ropes and other accessories are often received in excess at stations, and require to be conveyed in wagons to stations that are in want of these articles. This procedure is tantamount to an increase of the weight of empty wagons conveyed.

In stowing goods in wagons, straw is frequently made use of to prevent damage occurring by friction in the course of transit. Goods that need protection of this kind are usually such as need covering with tarpaulins. The provision of straw to be used for packing purposes must be held to be an expense pertaining to the service of truckage.

In calculating the cost of the interterminal service of truckage, or the use of wagons and other descriptions of vehicles, with their accessories, to carry merchandise and locomotive machinery in the process of conveyance, the expenses to be provided for are as follows:—

1. Consumption of stores, as oil, grease, straw for packing purposes, etc.
2. Incidental repairs of vehicles, tarpaulins, ropes, chains, etc., due to wear.
- 3 Allowance for the replacement of vehicles, tarpaulins, ropes, chains, etc, when worn-out or when deemed necessary (Depreciation of wagons)

In addition, provision must be made for profit on the capital invested in vehicles and their accessories.

For convenience of illustration, let the railway company, whose rates and charges are to form the subject of calculation, be called the South Northern Railway Company.

Let the initial distance of conveyance, for which rates are to be computed, be one mile.

Let the sum chosen to compute the cost of the interterminal service of railage, including taxes and profit, be 08*d.* per ton, per mile, reckoned on the total weight of each train. (Taxes annually paid by railway companies come to a very large amount. Parts of the sums to be employed as factors in the computation of rates and charges for the various services of railage are required on account of taxes, but, to simplify illustration, and since it is not essential that they should be specified, they are left undefined)

Let the sum chosen to compute the cost of the interterminal service of haulage, including profit, be 10*d.* per ton, per mile, reckoned on the total weight of each train

Let the sum chosen to compute the cost of the interterminal service of truckage, including profit, be 02*d.* per ton, per mile, reckoned on the total weight of each train.

Adding the sums together, the total sum chosen to compute the cost of the interterminal services of railage, haulage, and truckage, constituting

conveyance, including taxes and profit, is '20*d.* per ton, per mile, reckoned on the total weight of each train.

Let it be supposed that the average weight of a locomotive, tender, and brake-van, with their accessories, employed in the haulage of goods trains of every description, is 100 tons; and that the average weight of loads and wagons, forming a train-load, is 200 tons. In that case, the ratio of the weight of the instruments of power to the weight of the train-load is the same as of 1 to 2, or one-half. By adding '10*d.*, or one-half of '20*d.*, to '20*d.*, the sum of '30*d.* per ton, per mile, is obtained, which, applied to the weights of loads and wagons, or train-loads alone, will correctly compute the cost of the interterminal services of railage, haulage, and truckage, including taxes and profit, relating to the total weight of trains conveyed, without the weight of the instruments of power appearing in the calculations.

By this procedure, the respective sums per ton of load and wagon, per mile, comprehending the instruments of power, to be employed to compute the cost of the interterminal services of railage, haulage, and truckage, constituting conveyance, become altered as follows:—

	PER TON PER MILE.	SUMS PER TON OF LOAD AND WAGON PER MILE.
	<i>d.</i>	<i>d.</i>
Sum to compute the cost of the interterminal service of railage relating to loads and wagons . . . . .	08	
Add one-half of the above sum to compute the cost of the interterminal service of railage relating to the instruments of power . . . . .	04	'12
Sum to compute the cost of the interterminal service of haulage relating to loads and wagons . . . . .	10	
Add one-half of the above sum to compute the cost of the interterminal service of haulage relating to the instruments of power . . . . .	05	'15
Sum to compute the cost of the interterminal service of truckage relating to loads and wagons . . . . .	02	
Add one-half of the above sum to compute the cost of the interterminal service of truckage relating to the instruments of power . . . . .	01	'03
		<u>Total</u> '30

The sum of 30*d.*, thus obtained, is to be used as a factor with the weights of loads and wagons to compute rates for conveyance, per ton of load, per mile, including taxes and profit, and, in some circumstances, may become the rate itself.

## CHAPTER II

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE CARRIED IN OPEN AND IN COVERED WAGONS —FORMATION OF GRADES—RATES PER TON OF LOAD, PER MILE

MERCHANDISE may be separated into eight divisions of traffic, numbered and described as follows —

NOS OF DIVISIONS	DESCRIPTION OF MERCHANDISE FORMING THE DIVISIONS OF TRAFFIC
1	General merchandise carried in open wagons.
2	General merchandise carried in covered wagons.
3.	Articles of extraordinary weight or dimensions that require to be carried in peculiarly constructed wagons.
4	Articles of great length that occupy two or more wagons.
5	Coal, lime, and analogous merchandise, carried in wagons specially built and exclusively used for each kind of merchandise.
6.	Various kinds of merchandise, includible in other divisions of traffic, carried in traders' wagons which would otherwise be returned, empty, to private sidings.
7	Vehicles, running on their own wheels.
8.	Live stock.

To facilitate illustration, the divisions of traffic will be dealt with in the order in which they are entered.

General merchandise, whether carried in open or in covered wagons, may be described as consisting of articles of moderate weight, either packed or loose, that may be stowed in the space afforded by an ordinary wagon without exceeding it, and that may be placed in contact with other goods, when needful, without detriment to each other or to the wagon.

There are many kinds of general merchandise, some requiring low-sided wagons and others high-sided wagons for their reception. As examples of heavy merchandise, iron and steel, in certain forms, furnish full loads without taking up much stowing space, and, in numerous instances, do not need covers. Grain is of a heavy nature also, though full loads of it occupy more space than full loads of iron and steel, and

invariably require covers. Full loads of cotton and woollen goods, in certain forms, take up still more room, and need covers; a consignment often filling the stowing space of a wagon without reaching the weight of load which it is registered to carry. Full loads of light furniture require covers, and weigh much less than the greatest weights of loads which wagons are individually built to carry.

The same kind of merchandise may be packed in various ways. Goods compressed by hydraulic or other power naturally occupy less space than if uncompressed, and the increased density gives heavier loads. Goods of a mixed description are often packed together, as drapery, grocery, etc. Empty articles, as boxes, casks, sacks, etc., whether sent new from the makers, or returned by the consignees, pertain to general merchandise. A consignment of general merchandise may be more than a full load, equal to a full load, less than a full load, or may consist of a small parcel.

The kinds of general merchandise are so numerous, and the magnitudes of consignments are so various, that railway companies find it expedient to provide wagons of different powers and capacities, with different forms of upper structure, in order that loaders may be given an opportunity of choosing suitable wagons to receive the respective loads. This arrangement, however, does not secure the close adaptation to each other of loads and wagons, inasmuch as loaders are compelled to make use of the wagons that happen to be available, and their fitness for the consignments is greater or less according to circumstances. Wagons built by a railway company to carry general merchandise usually vary in length, have weights extending, probably, from about four tons to about seven tons, and afford different amounts of space for the reception of loads.

With regard to empty wagons, demand is subject to fluctuation owing to various causes. Merchants and manufacturers occasionally increase their purchases of goods when prices are low, or when circumstances seem to justify the proceeding. Although there is a certain quantity of general merchandise moving regularly every working-day, or on fixed days, between stations, the amount is augmented by the action of individuals in buying largely at intervals. The effect of this procedure is, firstly, that an extra supply of empty wagons is required at the stations whence the merchandise is to be forwarded, and, secondly, when the goods have been conveyed and disposed of, there is an additional number of empty wagons on hand at the receiving stations.

The weight of merchandise imported into this country exceeds the weight of merchandise exported from it. At many of the ports there is a constant demand for empty wagons; the incoming loaded wagons not being sufficient to carry away the goods arriving by sea. To supply this need, spare empty wagons from most stations are conveyed to the

stations in port-towns. Taking all stations into account, it may be assumed that at some places more loaded wagons are received than are required for the daily transmission of merchandise; at other places, fewer; and at other places the balance alters, being now on one side and now on the other.

If it be supposed that a consignment of merchandise is tendered at a station for conveyance, and that no empty wagon is on hand, rendering it necessary to convey a wagon from a distant station for the purpose of carrying the consignment, the cost of conveying the empty wagon is a part of the cost chargeable for the conveyance of the goods in question. The duty of a railway company is to convey empty wagons to such places as may require them, in time to prevent any delay that might else arise, and the cost incurred thereby must be paid for as if the wagons were expressly conveyed to accommodate traders in the manner supposed.

The supply of tarpaulins, ropes, etc., like that of wagons, is sometimes inadequate and sometimes in excess at stations. To remedy this, over-supplies are conveyed in wagons to stations that are in want of the articles. The act of conveying tarpaulins, ropes, etc., in such circumstances, is a needful one, and, therefore, the cost must be defrayed by traders.

The conveyance of empty wagons and of wagons containing folded tarpaulins, ropes, and other accessories, from stations where they are not required to stations that stand in need of them, is a matter to which railway companies should pay great attention. It may be presumed that good management keeps this source of expense at the lowest point.

The weight of loaded wagons, apart from the loads, and the weight of empty wagons and of wagons containing folded tarpaulins, ropes, etc., with the distances conveyed, should be carefully recorded. From the information thus obtained, the ratio of the weight of empty wagons, with their accessories, to the weight of loaded wagons, apart from the loads, conveyed one mile, may be calculated.

Let it be assumed that general merchandise carried in open wagons, constituting the first division of traffic, is conveyed from stations to stations in wagons provided by the railway company, and let the symbols  $A_1$  be used to signify that such merchandise is conveyed by one railway company only, under the conditions stated.

Let it be assumed that general merchandise carried in covered wagons, forming the second division of traffic, is conveyed from stations to stations in wagons provided by the railway company, and let the symbols  $B_1$  be employed to denote that such merchandise is conveyed by one railway company only, under the conditions stated.

The letters  $A$  and  $B$  are made use of for discriminative purposes only, and the figure  $1$  is employed to signify that conveyance is effected by one railway company.

By adding together the weights of open wagons employed to carry general merchandise, and by increasing the weight obtained so as to include a weight representative of loose binders, as ropes and chains, a total weight of open wagons, including loose binders, is obtained. On dividing this weight by the total number of open wagons, the average weight of open wagon, including a proportion for loose binders, is ascertained.

Let it be assumed that the average weight of open wagon, employed to carry general merchandise, is 5 tons, and that the maximum weight of load which it is registered to carry is 10 tons.

Since it is customary to convert open wagons into covered wagons by the agency of tarpaulins, for the purpose of carrying, in common with vans, merchandise that requires to be protected during transit, it becomes necessary, in order to obtain the average weight of covered wagon, to add to the average weight of open wagon a weight deemed to be equivalent in value to that of a cover averagely representative of the values of tarpaulins and roofs of vans combined.

Let it be supposed that the value of a cover—whether it consist of one or more tarpaulins or of solid structure, as the roof of a van—is equivalent to the value of half a ton of solid structure, or that the services of railage, haulage, and truckage, rendered in relation to solid structure weighing half a ton, may be substituted for the services averagely fulfilled by a cover alternately consisting of tarpaulin and solid structure. It shall be assumed, therefore, that the average weight of covered wagon is  $5\frac{1}{2}$  tons, and that the maximum weight of load which it is registered to carry is 10 tons.

With reference to general merchandise carried in open and in covered wagons, let it be assumed that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, is the same as of 1 to 4, or that the weight of each loaded wagon requires to be increased by one-fourth to include the conveyance of empty wagons.

Owing to the different sizes, capacities, and powers of wagons, and the numerous magnitudes of consignments of general merchandise, perfect adaptation of load to wagon can only occasionally be secured, and it becomes necessary to ascertain, by a suitable method of procedure, the greatest weight of load averagely obtainable in practice.

Let it be supposed that the average maximum weight of load obtained from each kind of general merchandise comprised in the first and second divisions of traffic, consignments of which furnish full loads, is three-fourths of the potential maximum weight of load. On the grounds assumed, therefore, the greatest weight of load averagely obtained from the heaviest kind of general merchandise will be  $7\frac{1}{2}$  tons, and, of course, from some kinds that are of a lighter nature, loads averagely weighing less than  $7\frac{1}{2}$  tons.

Let it be assumed that the average minimum weight of load, obtained from small consignments of general merchandise comprised in the first and second divisions of traffic, furnished by one or more traders, is 1 ton.

Between  $7\frac{1}{2}$  tons, the greatest weight of load, and 1 ton, the least weight of load, which it is assumed may be placed in wagons weighing 5 tons and  $5\frac{1}{2}$  tons, respectively representing the average weight, strength, and capacity of wagons built to carry general merchandise comprised in the first and second divisions of traffic, a great many weights intervene which it is impracticable to make use of specifically. It is, however, desirable that as many weights of loads between the greatest and least weights of loads as it is feasible to employ, should be chosen to form, individually, the subject of calculation.

Let twenty-two weights of loads be employed to mark or distinguish twenty-two grades, numbered from 7 to 28, relating to general merchandise carried in open wagons. Each weight of load must be joined with the average weight of open wagon, increased by one-fourth to include a proportionate part of the weight of empty wagons conveyed. Grades Nos. 1 to 6 are held in reserve for contingencies.

Let the same twenty-two weights of loads be employed to distinguish twenty-two grades, numbered from 8 to 29, relating to general merchandise carried in covered wagons. Each weight of load must be joined with the average weight of covered wagon, increased by one-fourth to include a proportionate part of the weight of empty wagons conveyed.

Let the twenty-two weights of loads, chosen to distinguish grades 7 to 28 and 8 to 29, and to be joined, respectively, with the average weights of wagons, increased by one-fourth to include the conveyance of empties, relating to general merchandise carried in open and in covered wagons, be as in Table on p. 83.

From the coupled weights of load and wagon, marking each grade, it is necessary to calculate the weight of wagon proportionate to 1 ton of load, and to set down the weights thus obtained immediately below the weights to which they relate. Sums are to be employed as factors with the unit-weights of loads and proportionate weights of wagons to compute rates and charges per ton of load.

As previously stated, the sum of .30*l*. per ton of load and wagon, per mile, is to be made use of to calculate the cost of conveying trains. Therefore, by employing the sum of .30*l*. as a factor with the unit-weights of loads and proportionate weights of wagons, respectively calculated from the weights of loads and wagons distinguishing grades 7 to 29, rates per ton of load, per mile, for general merchandise carried in open and in covered wagons, will be obtained.

With reference to the Examples that will be employed to illustrate



the subject, it is necessary to note, in the first place, that when the weights of wagons, proportioned to unit-weights of loads, consist, wholly or partly, of fractions of a ton, the fractions are always expressed in thirtieths of a ton, for the purpose of facilitating multiplication by 30d per ton; and in the second place, that the weights of loads and wagons and the unit-weights of loads and fractional weights of wagons to which they respectively relate, are not always strictly in proportion, but they will be found sufficiently near thereto for practical purposes.

GENERAL MERCHANDISE CARRIED IN OPEN WAGONS							GENERAL MERCHANDISE CARRIED IN COVERED WAGONS								
Nos of grades	A <sub>r</sub> Distinguishing weights of loads to be joined, individu ally, with 6½ tons, or one and a quarter times the weight of a wagon weighing 5 tons					Successive decreases of weight	Nos of grades	B <sub>r</sub> Distinguishing weights of loads to be joined, individu ally, with 6½ tons, or one and a quarter times the weight of a wagon weighing 5½ tons					Successive decreases of weight		
	Tons	Tons	cwts	qrs	Cwts			qrs	Tons	Tons	cwts	qrs		Cwts	qrs
7	7½	or	7	10	0	—	—	8	7½	or	7	10	0	—	—
8	6½	„	6	17	2	12	2	9	6½	„	6	17	2	12	2
9	6¼	„	6	5	0	12	2	10	6¼	„	6	5	0	12	2
10	5¾	„	5	12	2	12	2	11	5¾	„	5	12	2	12	2
11	5⅝	„	5	2	2	10	0	12	5⅝	„	5	2	2	10	0
12	4¾	„	4	12	2	10	0	13	4¾	„	4	12	2	10	0
13	4¼	„	4	4	0	8	2	14	4¼	„	4	4	0	8	2
14	3¾	„	3	16	0	8	0	15	3¾	„	3	16	0	8	0
15	3⅞	„	3	9	0	7	0	16	3⅞	„	3	9	0	7	0
16	3⅝	„	3	2	2	6	2	17	3⅝	„	3	2	2	6	2
17	2⅞	„	2	17	0	5	2	18	2⅞	„	2	17	0	5	2
18	2⅝	„	2	12	0	5	0	19	2⅝	„	2	12	0	5	0
19	2¼	„	2	7	2	4	2	20	2¼	„	2	7	2	4	2
20	2⅞	„	2	3	0	4	2	21	2⅞	„	2	3	0	4	2
21	1⅞	„	1	19	0	4	0	22	1⅞	„	1	19	0	4	0
22	1⅞	„	1	15	2	3	2	23	1⅞	„	1	15	2	3	2
23	1⅝	„	1	12	0	3	2	24	1⅝	„	1	12	0	3	2
24	1⅞	„	1	9	0	3	0	25	1⅞	„	1	9	0	3	0
25	1⅞	„	1	6	2	2	2	26	1⅞	„	1	6	2	2	2
26	1⅝	„	1	4	0	2	2	27	1⅝	„	1	4	0	2	2
27	1⅞	„	1	2	0	2	0	28	1⅞	„	1	2	0	2	0
28	1	„	1	0	0	2	0	29	1	„	1	0	0	2	0

The mode of calculating rates per ton, per mile, for general merchandise comprised in the first and second divisions of traffic, is shown in the first Example, now to be furnished, and twenty-three grades, numbered 7 to 29, are made use of. Twenty-two weights of loads, joined with appropriate weights of wagons, distinguish grades 7 to 28, and relate to general merchandise carried in open wagons. The same twenty-two weights of loads, joined with appropriate weights of wagons, distinguish grades 8 to 29, and relate to general merchandise carried in covered wagons. Below are entered the unit-weights of loads and proportionate weights of wagons calculated from the coupled weights of loads and wagons respectively marking the grades. The sum of 30d is employed as a factor with the unit-weights of loads and proportionate

## EXAMPLE I

SOUTH NORTHERN RAILWAY COMPANY

*General merchandise carried in open and in covered wagons—Grades, with distinguishing weights of loads joined with weights of wagons*  
*Rates per ton of load for the initial distance, one mile*

Nos OF GRADES	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
<b>A.</b> Distinguishing weights of loads (1)	Tons 7½	Tons 6½	Tons 6½	Tons 5½	Tons 5½	Tons 4½	Tons 4½	Tons 3½	Tons 3½	Tons 3½	Tons 2½	Tons 2½	Tons 2½	Tons 2½	Tons 2½	Tons 1½	Tons 1½	Tons 1½	Tons 1½	Tons 1½	Tons 1½	Tons 1½	Tons 1½
Average weights of wagons Add one-fourth of weights of to include the weight of empty wagons conveyed	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½	5 1½
Total weights of wagons	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
<b>B.</b> Distinguishing weights of loads (2)	—	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½	5½
Average weights of wagons Add one-fourth of weights of wagons to include the weight of empty wagons conveyed	—	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½
Total weights of wagons	—	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads Proportionate weights of wagons	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½	1 2½
Totals	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½	1½ 2½
Rates for conveyance one mile, computed at 30d per ton of load And at 30d per ton of wagon	30 25	30 27	30 30	30 33	30 36	30 40	30 44	30 49	30 54	30 60	30 66	30 72	30 79	30 87	30 96	30 106	30 117	30 129	30 142	30 156	30 171	30 188	30 206
Rates for the initial distance, one mile, including taxes	55	57	60	63	66	70	74	79	84	90	96	102	109	117	126	136	147	159	172	186	201	218	236

weights of wagons to calculate the rates per ton of load for the initial distance, one mile, including taxes.

With regard to each kind of general merchandise comprised in the first and second divisions of traffic, consignments of which furnish full loads invariably, frequently, or occasionally, it is necessary to ascertain the average maximum weight of load—three-quarters of the potential maximum weight of load—obtained from it, having regard to the manner in which it is packed. If packed in two or more ways, each mode of packing will probably yield a different maximum weight of load. Many different average maximum weights of loads are likely to be the outcome of this procedure. The weights of loads so obtained will coincide with, or approximate to, one or other of the weights of loads employed to distinguish the grades; and the rates calculated for each grade will apply to those kinds of general merchandise, when consigned in full loads, whose weights agree with, or approximate to, the weight of load distinguishing such grade. The name of each kind of merchandise, with the manner of packing, joined with the number of the grade to which it has been approximated when consigned in full loads, must be suitably recorded for the guidance of clerks and the information of traders. It must be understood that the grade recorded for full loads of any kind of general merchandise is assumed to be appropriate for quantities that are greater than full loads. Consignments of general merchandise, whose weights are less than the weights of full loads, must be approximated to one of the weights of loads distinguishing grades succeeding those for full loads; and an intimation to this effect will be all that is necessary in the way of instruction. Those kinds of merchandise that are invariably consigned in smaller quantities than full loads will fall under this rule. The final grade for each division of traffic shall be deemed suitable for small consignments of all magnitudes.

Owing to their bulk, shape, or other characteristic, certain articles of merchandise occupy the whole or a large part of the stowing space of a wagon, and yet are so light as to weigh less than 1 ton—the weight of load chosen to distinguish the final grade for each division of general merchandise. In all other respects, these articles answer to the description of general merchandise. Merchandise of this character may be termed exceptional general merchandise, and included in the two divisions of traffic according as the articles composing it need carrying in open or in covered wagons. Let it be made a condition that when a consignment of merchandise occupies a wagon exclusively, or monopolizes a large part of its stowing space, and furnishes a load that weighs less than 1 ton, it shall be charged for as if weighing 1 ton.

## CHAPTER III

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—FIRST AND SECOND TERMINAL SERVICES OF STOPPAGE

FOR the prosecution of its business, it is incumbent on a railway company to acquire, in towns and populous districts, suitable plots of land contiguous to the railway. After each plot has been levelled and prepared, sidings, communicating with the main line, are constructed on it, and a shed or a more substantial structure is erected, with offices, stages, cranes, and other requisites, the whole forming a station. The journeys of trains take place for the purpose of conveying wagons, loaded or empty, from one station to another station, which then become and may be called, respectively, the first and second terminal stations of a journey.

The terminal services to be first considered are those which are inseparably connected with conveyance. In forming a train, the locomotive, controlled by its attendants, has to enter the siding where the wagons intended for conveyance are standing, draw them out, and attach them to the brake-van. If the wagons be intended for one station where the journey ends, they are detached from the brake-van on arrival, and removed from the main line to one of the sidings of the station; the engine and its staff proceeding to form a second train and commence another journey. If the wagons be intended for various stations, the train must stop at each station to accomplish the service of transfer.

When a train stops at a terminal station, there ensues a saving of fuel and water, and a diminished wear of rails, locomotive machinery, and wagons. The main line, however, or that section of it which is blocked to following trains, is occupied as completely as if the train were moving. The locomotive, also, is still employed, as are the men in charge of it, together with the signalmen on the section of the line where the stoppage takes place. Probably, the lessened cost of the stopped train might be calculated very nearly by careful and repeated observation of the facts presented when stoppages occur. As a set-off against the lessened expenses, the stopping of a train usually causes slight collisions

between the wagons forming the train-load, and, on restarting, there is strain on the couplings of the wagons ; both occurrences tending to the deterioration of vehicles. Also, the momentum of the train is lost by stopping, and has to be regained.

Here it may be mentioned that shunters or pointsmen, forming a part of the staff at stations, are often required, in connection with the stoppage of trains, to move and hold the points leading to the inner sidings of stations where wagons may be awaiting removal, or where the incoming wagons have to be placed. The duty thus performed constitutes only a small part of their daily task, and it will be convenient and perfectly equitable if its cost be reckoned apart from the services of stoppage, and joined to that of the duties relating exclusively to the work proper to the station, which will be treated of hereafter.

Naturally, at stations that form the beginning of a journey wagons are attached only, and at stations that end a journey are detached only. At the intermediate stations of a journey, it is customary for wagons to be attached and detached at each stop, although, in some instances, wagons are attached or detached only. In the latter event, it may be due to a special arrangement made for convenience, or it may be a casual occurrence. At every place, however, where wagons are received, wagons are despatched therefrom, creating a movement of traffic to and fro, and the collection and delivery, or the attachment and detachment of wagons, loaded or empty, whether effected separately or at the same time, are constant and indispensable terminal services, complementary to conveyance. It will thus be seen that conveyance, for which a rate per ton, per mile, may be charged, begins and ends on the main line, and that the transfer of wagons from a siding of a station to the main line before conveyance, and from the main line to a siding of a station after conveyance, constitute two separate services which may be called the first and second terminal services of stoppage.

There is great diversity in the number of wagons transferred at stations. Some goods trains are appointed to make journeys between two stations only; the train-load being attached at the first station and detached at the second station. Other trains are appointed to stop frequently during the course of a journey to transfer a few wagons at a time. This state of things is due, partly, to the number of the inhabitants in each town or district, partly, to their vocations, which are determined by the kinds of manufactures or works established in the neighbourhood, and, partly, to other causes.

A locomotive, in charge of a staff of men, engaged in conveying a train, and travelling a long distance before stopping, seems to do much more work than another engine employed to convey a train, and stopping frequently during a journey. The additional amount of work accomplished by the former is not so great as it appears, when it is

carefully considered, and is entirely due to the difference of conditions between a course of unbroken transit and one interrupted by necessary stoppages.

It is to be noted that when a train stops to attach and detach wagons, the time taken is rather more than when attachment or detachment only is required. Also, the time occupied in transferring many wagons is somewhat greater than the time needed to transfer few wagons. Yet, if it be assumed that only one shunting movement is requisite for attachment and one for detachment, the difference of time between transferring one wagon and a dozen wagons is but small.

To prevent misunderstanding, and with a view to the correct calculation of cost, it is necessary to define the conditions under which the terminal services of stoppage are meant to be performed. They are as follows:—

1. The stoppage of a train at a station to attach and detach wagons must be presumed to take place without interruption, and expense occasioned by incidental delay during the operation must be attributed to the performance of suppletive services.

2. Wagons must be arranged in due order, and placed at the entrance of a siding anterior to the arrival of the train appointed to convey them, so as to economize time and labour at each stop.

3. No marshalling must be performed by the train-engine save what may be unavoidable in disposing of the wagons forming its own train-load.

It has already been stated (ch i, p 71) that note should be taken of the weights and speeds of trains, the time occupied in stopping at each station, and the weights of wagons attached and detached during each stop. It is desirable that this information should be recorded as accurately as possible so that correct averages may be calculated.

The amounts representing the cost of terminal services of every kind, including taxes and profit, or profit only, are called charges, to distinguish them from rates for conveyance

A terminal service of stoppage comprehends the three services of railage, haulage, and truckage, fulfilled in relation to the whole of a train during the time that a part of the train-load, or the train-load itself, is transferred at a terminal station.

Let it be assumed that the average speed of trains conveying merchandise is twenty miles an hour, or one mile in three minutes.

Let it be supposed that the average weight of wagons, loaded and empty transferred by a locomotive and its staff at each stop at a station, is 100 tons.

Let it be assumed that the average length of time required to

transfer wagons, loaded and empty, at each stop at a station, is six minutes.

Let it be supposed that the value of a service of stoppage lasting six minutes is equivalent to the value of the interterminal services of railage, haulage, and truckage, assumed to be performed in conveying a train of average weight during a period of six minutes. The average weight of train-load has been assumed to be 200 tons; the average distance travelled by a train in six minutes to be two miles; and the sum chosen to compute the cost of conveyance (including the instruments of power) to be 30*£* per ton of load and wagon, per mile. By multiplying 200 tons by 60*£*, the sum, per ton, of load and wagon, for two miles, the product is 120*£*, or 10*s*. By dividing this amount by 100 tons, the weight of wagons, loaded and empty, averagely transferred at each stop, the quotient is 120*£*, which is the sum, per ton of load and wagon, to be employed to compute charges for each terminal service of stoppage, performed in regard to merchandise comprised in every division of traffic.

Resulting from the employment of the sum named, charges for the first and second terminal services of stoppage, performed in reference to general merchandise carried in open and in covered wagons, are shown in the next Example (Ex 2). The average weight of wagon, and the weight to be added thereto on account of empty wagons conveyed, for each division of traffic, are entered, separately, in brackets.

## EXAMPLE 2

SOUTH NORTHERN

*General merchandise carried in open and in covered*

NOS OF GRADES	7	8	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>Ar.</b> Distinguishing weights of loads (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½	3½
Average weights of wagons (5 tons + 1½ tons for empties)	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
<b>Br.</b> Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	¾	¾	1	1 ⅛	1 ⅛	1 ⅛	1 ⅛	1 ⅛	1 ⅛	2
Totals	1 ⅛	1 ⅛	2	2 ⅛	2 ⅛	2 ⅛	2 ⅛	2 ⅛	2 ⅛	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st terminal service of stoppage, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 1 200d per ton of wagon	1 000	1 080	1 200	1 320	1 440	1 600	1 760	1 960	2 160	2 400
Total charges for the 1st terminal service of stoppage	2 200	2 280	2 400	2 520	2 640	2 800	2 960	3 160	3 360	3 600
Charges for the 2nd terminal service of stoppage, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 1 200d per ton of wagon	1 000	1 080	1 200	1 320	1 440	1 600	1 760	1 960	2 160	2 400
Total charges for the 2nd terminal service of stoppage	2 200	2 280	2 400	2 520	2 640	2 800	2 960	3 160	3 360	3 600
Total charges for the 1st and 2nd terminal services of stoppage, including taxes	4 400	4 560	4 800	5 040	5 280	5 600	5 920	6 320	6 720	7 200



## RAILWAY COMPANY

*wagons—Charges for the first and second terminal services of stoppage.*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{1}{2}$	2	$2\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	1	—
$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	—
$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	1
$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{0}{16}$	$2\frac{1}{16}$	$2\frac{3}{16}$	$2\frac{5}{16}$	$3\frac{0}{16}$	$3\frac{1}{16}$	$3\frac{3}{16}$	$4\frac{0}{16}$	$4\frac{2}{16}$	$5\frac{0}{16}$	$5\frac{1}{16}$	$6\frac{3}{16}$	$6\frac{5}{16}$
$3\frac{0}{16}$	$3\frac{1}{16}$	$3\frac{3}{16}$	$3\frac{5}{16}$	$4\frac{0}{16}$	$4\frac{1}{16}$	$4\frac{3}{16}$	$5\frac{0}{16}$	$5\frac{1}{16}$	$6\frac{0}{16}$	$6\frac{1}{16}$	$7\frac{3}{16}$	$7\frac{5}{16}$
Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
2 640	2 880	3 160	3 480	3 840	4 240	4 680	5 160	5 680	6 240	6 840	7 520	8 240
3 840	4 080	4 360	4 680	5 040	5 440	5 880	6 360	6 880	7 440	8 040	8 720	9 440
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
2 640	2 880	3 160	3 480	3 840	4 240	4 680	5 160	5 680	6 240	6 840	7 520	8 240
3 840	4 080	4 360	4 680	5 040	5 440	5 880	6 360	6 880	7 440	8 040	8 720	9 440
7 680	8 160	8 720	9 360	10 080	10 880	11 760	12 720	13 760	14 880	16 080	17 440	18 880

## CHAPTER IV

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—FIRST AND SECOND TERMINAL SERVICES OF RAILAGE, HAULAGE, AND TRUCKAGE

LAND is usually dear in towns and cheap in country places, and plots of ground, acquired by a railway company to form sites for stations, may be expected to vary in price. By dividing the amount invested in land for stations by the number of square yards bought, the average cost, per square yard, is obtained. In addition to the equalization of the value of land, the value of structures and of the instruments requisite for the equipment of stations, as sidings, turn-tables, stages, etc., as well as taxes, lighting, etc., should be equalized also. By this procedure, the convenience afforded by uniformity of cost is gained without causing loss to the railway company, and equality of treatment is secured to the trader.

A goods station is a place provided for the reception, unloading, loading, and despatch of wagons, and for the receipt and delivery of merchandise from and to the traders located in the vicinity. Every station is a first and second terminal station according as it forms the place of departure and arrival of merchandise conveyed by train. Wagons are forwarded therefrom and received thereat, and services relating to those waiting to be loaded, or loaded and placed in position for departure, and to those waiting to be unloaded, are rendered at one and the same time.

Wagons containing merchandise included in any division of traffic may be placed separately, or promiscuously with others, as may be convenient, in the sidings of a station, but the circumstance will not affect the terminal services rendered in regard to such wagons.

*Terminal service of railage.*—During the whole of the time that a wagon remains at a station, whether loaded or empty, moving or at rest, a section of siding, corresponding with the length of the wagon, is constantly occupied. The wagon is stationary during most of the time, waiting to be loaded, unloaded, or despatched. Occasionally, at times even frequently, a wagon is moved from one siding to another, and, in the process of shunting, may have to pass on and off the main line. The employment of the main line for the purposes of shunting involves the

use of a definite section of railway, together with the services of signalmen, and is to be deprecated, since it adds danger and expense to the proceedings. It is desirable that the sidings provided at stations should be sufficiently extensive to allow of the passage of wagons to and fro, in the operations of shunting, without having recourse to the main line.

In the terminal service of railage it is proper to include the use, by carts and other vehicles, of the station-yard and the roadways between the entrance and all parts of a station, provided as a means of passage to and from the outer thoroughfares. At times, it may be necessary for carts and other vehicles to stand under load, or for their contents to be deposited on the ground, or on a stage or wharf, owing to a deficiency of wagons or other cause. The temporary occupation of ground, stage, or wharf, at a station, by goods proceeding outward or inward, if for the railway company's convenience, must be considered to form a part of the terminal service of railage.

The duty of lighting stations, the labour of cleansing the roadways, and the rates and taxes leviable, must be held to pertain to the terminal service of railage.

The terminal service of railage is measured by the weight of each wagon, loaded, and its weight, empty, and the period of time during which it remains, alternately loaded and empty, at a station.

*Terminal service of haulage.*—In order that wagons may be unloaded, loaded, and despatched, conveniently and in order, they require to be moved from place to place in the sidings of stations, according to circumstances. The movements are effected by horse, hydraulic, or steam power, or by the force of gravitation; men having to be employed to control the operations. The extent of the service of haulage performed at stations is variable, depending, at each place, on the kind and amount of traffic daily dealt with, the adaptation of the sidings and warehouses, the number, power, and position of the cranes, the action of traders (consignees), the judgment of superintendents, and other causes. It is desirable that the sidings should furnish sufficient space for the accomplishment of all the operations of shunting. When they fail to do so, the use of the main line is inevitable.

The warehouses of stations are provided with platforms or stages, having a height from the ground nearly corresponding with, but a little higher than, that of the floor of a wagon. A line of rails, forming the continuation of a siding, runs alongside of each stage, by means of which wagons are brought in to be loaded or unloaded under cover, and the stage, being almost level with the floors, affords a convenient medium for the transmission of articles to and from the wagons, as well as for the preparative assortment of consignments and their provisional storage. At small stations, one stage and one line of rails suffice for the operations of loading and unloading, but at large stations it is necessary to divide

the work and provide separate stages and lines of rails, and, in some instances, separate warehouses. At large stations, therefore, when wagons have been unloaded alongside of one stage, they need to be transferred to another line of rails, bordering a stage appropriated to purposes of loading. These movements are usually effected by means of turn-tables and cross-lines in conjunction with the sidings, and by the use of horse or hydraulic power. Paved roadways are constructed so as to enable traders' carts and other vehicles to approach the stages for the purposes of loading and unloading.

When loaded or empty wagons arrive at a station, they are, generally, placed together in a siding, and, afterwards, have to be moved to different parts of the station, as may be necessary. Some may be required in the warehouse, and some may be wanted under outside cranes, while others may be unloaded or loaded at any convenient place in the open air. Resulting from this action, it frequently happens that a number of loaded wagons are placed in a siding to await discharge, and that a few—not standing next to each other, but here and there—are, for special reasons, unloaded first, and, soon afterwards, are wanted for the purpose of loading either in the warehouse or under cranes at some other part of the station, or to send away as spare empty wagons to stations where they are needed. An engine, in charge of skilled individuals, is then employed to shunt out the empty wagons, and the task of having to move the loaded wagons in the process of shunting out the empties, which is unavoidable, increases the cost. Or, taking the converse of the same illustration, it may be necessary to shunt out some of the loaded wagons that stand interplaced with empties in a siding, and put them in another siding where there is more convenience for their discharge. This action necessitates the shunting of the empty as well as the loaded wagons, and adds, similarly, to expense.

When wagons have been loaded and labelled, they have to be marshalled or placed in due order so that the trains appointed to attach them and convey them to their several destinations may perform the duty with the least expenditure of time. Wagons are often loaded while standing in different sidings, and their subsequent collection and marshalling occasion a considerable amount of shunting, which always includes the shunting of other wagons that happen to be interplaced with them.

At small stations, where not much shunting and marshalling are required, it may be found more economical to let the train-engines do the work when they stop to transfer wagons, than to despatch locomotives and men specially for the purpose. When this course is followed, the work executed pertains to the terminal service of haulage, and not to the terminal service of stoppage to transfer wagons.

It will be convenient and quite just that the labour afforded by men,

part of the station staff, acting as shunters and pointsmen in the operations of transferring wagons when stoppages of trains occur, should be judged to form a part of the terminal service of haulage.

The employment of locomotives, with their accessories, for the purpose of shunting, involves the performance of the services of railage, haulage, and truckage, in relation to the instruments of power themselves. It is inexpedient to dissociate them, and, therefore, the three services thus rendered shall be deemed, in the computation of cost, to form, jointly, a part of the terminal service of haulage.

The daily preparation of engines appointed for the purpose of shunting, the time expended by drivers, firemen, and guards, forming the staff of shunting-engines, in making ready for the fulfilment of their daily task, and executing any other necessary work, apart from the terminal service of haulage, may be ranked as suppletive duties. Unavoidable interruptions, from any cause, of the operations of shunting at stations, are the occasion of expense, and pertain to suppletive services.

Horses, employed for the purpose of moving wagons in the sidings of stations, require to be lodged in stables, and need daily attention to keep them in good condition and fit for use. The care thus bestowed forms a part of suppletive duties.

The performance of all suppletive services must be taken into account in computing the cost of the terminal service of haulage.

The state of the weather exercises an influence on the operations of haulage performed at stations. Wagons are more difficult to move in frosty or snowy weather than during a mild season.

It may be stated that the service of haulage is an essential part of the daily work at stations, is effected by the agency of different kinds of power, is irregular in amount or extent, and, in its performance, the unavoidable interplacement of wagons occasions an increase of the cost of both first and second terminal services.

*Terminal service of truckage.*—Warehouses or sheds are erected, with sidings passing through them, in order that wagons may be brought under cover to be loaded and unloaded. These structures take the place of tarpaulins in preventing damage by rain, and the cost, in proportion to the amount of use for the object named, pertains to the terminal service of truckage. It has already been supposed that the instrumental value of a tarpaulin is equivalent to that of half a ton of solid structure, and the temporary substitution of a shed for tarpaulins in order that loading and unloading may proceed without damage to goods, constitutes a continuation of the service of covering. With regard to the terminal service of truckage, therefore, the addition of half a ton to the weight of a wagon, whether as an equivalent for a tarpaulin or for a proportion of the covering furnished by a shed, must be deemed to be needful during the whole of the time that the service is rendered.

The terminal service of truckage is measured by the weight of each wagon, loaded, and its weight, empty, including the weight of its accessories, and the period of time during which it remains, alternately loaded and empty, together with its accessories, at a station.

The loading and unloading of wagons is hastened or retarded owing to a variety of causes. When merchandise is tendered for conveyance, it is necessary that wagons should be placed in positions convenient for its reception. This duty is often performed beforehand in order that loading and despatch may be expedited. Sometimes, however, more or less delay occurs before loading can take place. For example, wagons have, occasionally, to be discharged specially for the purpose of providing empties, if there be a scarcity, and empty wagons, when wanted, may be inaccessibly situated in the sidings, and cannot be moved, immediately, to the right positions.

After conveyance, the stay of loaded wagons at stations, before being discharged, is extremely variable. Frequently loaded wagons are received and discharged within the space of an hour, in other cases they stand under load for several days, waiting the convenience of traders. When a trader sends goods by railway to another trader, the former ought to apprise the latter, by post or other medium, of his action, so that preparation may be made to receive them. The time of arrival of goods at any station is somewhat uncertain, and therefore it is the duty of a railway company to advise the consignee when the event occurs in order that he may arrange for their removal forthwith. The consignee does not always find it convenient to send for the goods immediately, and consequently delay occurs; the wagon remaining under load for an indefinite period of time. When a railway company undertakes to cart goods from a station to traders whose places of business are situated in the locality, the duty of sending advice-notes to such traders becomes unnecessary. Taking all stations into account, a large part of merchandise is delivered to consignees on the day of arrival, a part on the day after that of arrival, a part on the third day; and, in some instances, still more time elapses before the contents of wagons are disposed of.

A reasonable period of time is required to enable a railway company to perform each of the following duties —

To place empty wagons in position for loading, and to load, marshal them, and effect their departure.

To collect empty wagons from the various sidings in which they happen to stand, place them together, and send them away from stations that do not require them to stations that are in want of them.

To accomplish the discharge of wagons after conveyance

The respective times during which wagons, alternately loaded and empty, remain at stations, should be carefully noted and recorded, in order that the average periods of time, reasonably requisite for the fulfilment of the duties mentioned, may be ascertained.

Let it be supposed that the average length of time required by a railway company to perform the first terminal services of railage, haulage, and truckage, at first terminal stations, is one day, divided thus: half a day to place empty wagons in position for loading, and half a day to load, marshal, and despatch them.

Let it be supposed that when wagons are discharged at a station, and have to be sent, empty, to other stations to be loaded, one day is required to move them from the sidings in which they stand, place them in position for departure, and despatch them. Also, let it be supposed that when they arrive at the stations where they are to be loaded, half a day is required to place them in position for loading, and half a day to load, marshal, and despatch them.

Although the services rendered at second terminal stations in regard to empty wagons despatched from second terminal stations properly pertain to the first terminal services, it must be remembered that, in some instances, the respective terminal places will be a station and a private siding; the latter being provided by a trader. Therefore, in order that each terminal place, whether station or private siding, may be duly credited with the services rendered thereat, it is necessary that the charges for the terminal services of railage, haulage, and truckage rendered at second terminal stations in regard to empty wagons despatched from second terminal stations, should be added to the charges for the second terminal services of the same denomination, though pertaining to the charges for the first terminal services.

Let it be supposed that the maximum length of time allowed for wagons to remain under load at second terminal stations for the convenience of traders, is three days, and that the average length of time during which they remain undischarged, taking all wagons into account, is two days. On this assumption, the second terminal services of railage, haulage, and truckage, relating to loaded wagons, are rendered during a period of two days.

In relation to general merchandise comprised in both divisions of traffic, the average weights of wagons have been increased by one-fourth to include the conveyance of empty wagons. Charges, per ton of wagon, for the first and second terminal services of railage, haulage, and truckage, require to be computed apart from the added weight for empties. Instead of altering the weights of wagons, which would be an irksome task, it will be more convenient and equally effective to let them remain unchanged, and to alter, in a corresponding degree, the sum, per ton of wagon, chosen to compute charges for each service. This course will be adopted.

## EXAMPLE 3

SOUTH NORTHERN

*General merchandise carried in open and in covered*

NOS OF GRADES	7	8	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>Ar.</b> Distinguishing weights of loads (1)	7½	6½	6¼	5½	5½	4½	4½	3½	3¾	3½
Average weights of wagons (5 tons + 1¼ tons for empties)	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6¼
<b>Br.</b> Distinguishing weights of loads (2)	—	7½	6½	6¼	5½	5½	4½	4½	3½	3¾
Average weights of wagons (5½ tons + 1¾ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	¾	¾	1	1¾	1¾	1¾	1¾	1¾	1¾	2
Totals	1¾	1¾	2	2¾	2¾	2¾	2¾	2¾	2¾	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of railrage, computed at 150¢ per ton of load	150	150	150	150	150	150	150	150	150	150
And at 240¢ per ton of wagon	200	216	240	264	288	320	352	392	432	480
Total charges for a portion of the 1st terminal service of railrage	350	366	390	414	438	470	502	542	582	630
Charges for the 2nd terminal service of railrage, computed at 600¢ per ton of load	600	600	600	600	600	600	600	600	600	600
And at 480¢ per ton of wagon	400	432	480	528	576	640	704	784	864	960
Charges for that portion of the 1st terminal service of railrage which is rendered at 2nd terminal stations, computed at 600¢ per ton of wagon	050	054	060	066	072	080	088	098	108	120
Total charges for the 2nd and a portion of the 1st terminal service of railrage	1 050	1 086	1 140	1 194	1 248	1 320	1 392	1 482	1 572	1 680
Total charges for the 1st and 2nd terminal services of railrage, including taxes	1 400	1 452	1 530	1 608	1 686	1 790	1 894	2 024	2 154	2 310



RAILWAY COMPANY

*wagons—Charges for the first and second terminal services of 1 ailage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{1}{2}$	$2\frac{2}{3}$	$2\frac{3}{4}$	$2\frac{4}{5}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{4}$	1	—
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	—
$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	1	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	$1\frac{1}{4}$	1
$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{5}{8}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{3}{8}$	$4\frac{3}{8}$	$5\frac{3}{8}$	$5\frac{3}{8}$	$6\frac{3}{8}$	$6\frac{3}{8}$
$3\frac{5}{8}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{5}{8}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{5}{8}$	$5\frac{3}{4}$	$6\frac{5}{8}$	$6\frac{3}{4}$	$7\frac{5}{8}$	$7\frac{3}{4}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
150	150	150	150	150	150	150	150	150	150	150	150	150
528	576	632	696	768	848	936	1 032	1 136	1 248	1 368	1 504	1 648
678	726	782	846	918	998	1 086	1 182	1 286	1 398	1 518	1 654	1 798
600	600	600	600	600	600	600	600	600	600	600	600	600
1 056	1 152	1 264	1 392	1 536	1 696	1 872	2 064	2 272	2 496	2 736	3 008	3 296
132	144	158	174	192	212	234	258	284	312	342	376	412
1 788	1 896	2 022	2 166	2 328	2 508	2 706	2 922	3 156	3 408	3 678	3 984	4 308
2 466	2 622	2 804	3 012	3 246	3 506	3 792	4 104	4 442	4 806	5 196	5 638	6 106

In calculating the cost of the terminal services of railage, or the use of terminal stations in reference to merchandise comprised in all the divisions of traffic, the expenses to be taken into account are as follows —

- 1 Proportion of wages and salaries of signalmen, pointsmen, and superintendents for the occasional use of the main line
2. Wages and salaries of sweepers, lamplighters, and superintendents
- 3 Consumption of stores, as oil, gas, coal, etc.
4. Incidental repairs of sidings, cross-lines, turn-tables, roadways, structures, etc, due to wear
5. Allowance for the relaying of rails, sleepers, turn-tables, roadways, etc, and for the rebuilding of structures, when worn-out or when deemed necessary (Depreciation of stations).
6. Taxes.

In addition, provision must be made for profit on the capital invested in stations

Let the sums chosen to compute charges for that portion of the first terminal service of railage which is rendered at first terminal stations in relation to general merchandise carried in open and in covered wagons, during a period of half a day, be  $\cdot 150d$  per ton of load, and, during a period of one day,  $\cdot 300d$  per ton of wagon, including taxes and profit. The weights of wagons carrying loads have been increased by one-fourth to include the conveyance of empty wagons. To correct the weights added on this account, let  $\cdot 240d$  per ton, or four-fifths of  $\cdot 300d$ , be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of railage which is rendered at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of railage, rendered in relation to general merchandise carried in open and in covered wagons, during a period of two days be  $600d$  per ton of load, and  $600d$  per ton of wagon, including taxes and profit. To correct the weights added on account of empty wagons, let  $\cdot 480d$  per ton, or four-fifths of  $600d$ , be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of railage.

Let the sum chosen to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations in reference to empty wagons that have carried general merchandise during a period of one day be  $300d$  per ton, including taxes and profit. The weights of wagons carrying loads have been increased by one-fourth to include the conveyance of empty wagons, and, therefore, the

sum named is applicable to one-fifth of the increased weights of wagons. To make correction, let '060*d* per ton, or one-fifth of 300*d*. be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of railage, rendered in regard to general merchandise carried in open and in covered wagons, are shown in the last Example (pp 98, 99, Ex. 3)

In calculating the cost of the terminal services of haulage, or the use at stations of horse, hydraulic, or steam power, and of locomotive machinery, in reference to merchandise comprised in all the divisions of traffic, the expenses to be taken into account are as follows.—

1 Wages and salaries of drivers, firemen, engine-cleaners, and superintendents.

2 Wages and salaries of guards and superintendents

3 Wages and salaries of shunters, horse-drivers, inspectors, and superintendents.

4 Consumption of fuel and water in the production of power

5 Consumption of provender, straw, etc., for horses.

6 Consumption of stores, as oil, tallow, cotton waste, etc

7. Incidental repairs of locomotive machinery, structures, etc, due to wear.

8. Allowance for the replacement of locomotive machinery, horses, etc., and the rebuilding of engine-sheds, stables, etc, when worn-out or when deemed necessary (Depreciation of locomotive machinery used at stations).

9 Suppletive services

10 Changes of weather.

In addition, provision must be made for profit on the capital invested in locomotive machinery, horses, etc, used at stations.

Let the sums chosen to compute charges for that portion of the first terminal service of haulage which is performed at first terminal stations in relation to general merchandise carried in open and in covered wagons, during a period of half a day, be 300*d* per ton of load, and, during a period of one day, 600*d* per ton of wagon, including profit. To correct the weights added on account of empty wagons, let '480*d* per ton, or four-fifths of '600*d*, be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of haulage which is performed at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of haulage, performed in relation to general merchandise carried

## EXAMPLE 4

SOUTH NORTHERN

*General merchandise carried in open and in covered*

NOS OF GRADES	7	8	9	10	11	12	13	14	15	16
<b>Ar.</b> Distinguishing weights of loads . (1)	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Average weights of wagons (5 tons + 1½ tons for empties)	7½	6½	6¼	5½	5½	4½	4½	3½	3½	3½
	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
<b>Br</b> Distinguishing weights of loads . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	¾	¾	1	¾	¾	¾	¾	¾	¾	2
Totals	1¾	1¾	2	2¾	2¾	2¾	2¾	2¾	2¾	3
Charges for a portion of the 1st terminal service of haulage, computed at 300d per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
And at 480d per ton of wagon	300	300	300	300	300	300	300	300	300	300
	400	432	480	528	576	640	704	784	864	960
Total charges for a portion of the 1st terminal service of haulage	700	732	780	828	876	940	1 004	1 084	1 164	1 260
Charges for the 2nd terminal service of haulage, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 960d per ton of wagon	800	864	960	1 056	1 152	1 280	1 408	1 568	1 728	1 920
Charges for that portion of the 1st terminal service of haulage which is performed at 2nd terminal stations, computed at 120d per ton of wagon	100	108	120	132	144	160	176	196	216	240
Total charges for the 2nd and a portion of the 1st terminal service of haulage	2 100	2 172	2 280	2 388	2 496	2 640	2 784	2 964	3 144	3 360
Total charges for the 1st and 2nd terminal services of haulage	2 800	2 904	3 060	3 216	3 372	3 580	3 788	4 048	4 308	4 620

## RAILWAY COMPANY

*wagons—Charges for the first and second terminal services of haulage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$21\frac{7}{10}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{10}$	$1\frac{13}{20}$	$1\frac{11}{20}$	$1\frac{3}{8}$	$1\frac{9}{20}$	$1\frac{13}{40}$	$1\frac{1}{4}$	$1\frac{1}{10}$	1	—
$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	—
$3\frac{1}{8}$	$21\frac{7}{10}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{10}$	$1\frac{13}{20}$	$1\frac{11}{20}$	$1\frac{3}{8}$	$1\frac{9}{20}$	$1\frac{13}{40}$	$1\frac{1}{8}$	$1\frac{1}{10}$	1
$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{9}{20}$	$21\frac{3}{8}$	$21\frac{3}{8}$	$2\frac{3}{10}$	$3\frac{9}{20}$	$3\frac{1}{8}$	$3\frac{3}{10}$	$4\frac{9}{20}$	$4\frac{3}{8}$	$5\frac{9}{20}$	$5\frac{1}{10}$	$6\frac{3}{8}$	$6\frac{3}{10}$
$3\frac{9}{20}$	$31\frac{3}{8}$	$31\frac{3}{8}$	$3\frac{3}{10}$	$4\frac{9}{20}$	$4\frac{1}{8}$	$4\frac{3}{10}$	$5\frac{9}{20}$	$5\frac{3}{8}$	$6\frac{9}{20}$	$6\frac{1}{10}$	$7\frac{3}{8}$	$7\frac{3}{10}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
300	300	300	300	300	300	300	300	300	300	300	300	300
1 056	1 152	1 264	1 392	1 536	1 696	1 872	2 064	2 272	2 496	2 736	3 008	3 296
1 356	1 452	1 564	1 692	1 836	1 996	2 172	2 364	2 572	2 796	3 036	3 308	3 596
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
2 112	2 304	2 528	2 784	3 072	3 392	3 744	4 128	4 544	4 992	5 472	6 016	6 592
264	288	316	348	384	424	468	516	568	624	684	752	824
3 576	3 792	4 044	4 332	4 656	5 016	5 412	5 844	6 312	6 816	7 356	7 968	8 616
4 932	5 244	5 608	6 024	6 492	7 012	7 584	8 208	8 884	9 612	10 392	11 276	12 212

in open and in covered wagons, during a period of two days, be 1'200*d.* per ton of load and 1'200*d.* per ton of wagon, including profit. To correct the weights added on account of empty wagons, let '960*d.* per ton, or four-fifths of 1'200*d.*, be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of haulage.

Let the sum chosen to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations in reference to empty wagons that have carried general merchandise, during a period of one day, be 600*d.* per ton, including profit. The weights of wagons carrying loads have been increased by one-fourth to include the conveyance of empty wagons, and, therefore, the sum named is applicable to one-fifth of the increased weights of wagons. To make correction, let '120*d.* per ton, or one-fifth of '600*d.*, be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of haulage, performed in regard to general merchandise carried in open and in covered wagons, are shown in the last Example (pp. 102, 103, Ex. 4).

In calculating the cost of the terminal services of truckage, or the use at stations of wagons, tarpaulins, ropes, chains, and other accessories, in reference to merchandise comprised in all the divisions of traffic, the expenses to be taken into account are as follows :—

1. Wages and salaries of greasers, inspectors, and superintendents
2. Proportion of the consumption of stores, as oil, grease, straw for packing purposes, etc
3. Proportion of the incidental repairs of wagons, tarpaulins, ropes, chains, and other accessories, including the repairs of sheds used as shelters for loading and unloading wagons, due to wear.
4. Proportion of allowance for the replacement of wagons, tarpaulins, and other accessories, and for the rebuilding of sheds used as shelters for loading and unloading wagons, when worn-out or when deemed necessary (Depreciation of wagons at stations)

In addition, provision must be made for profit on the capital invested in wagons and their accessories during their use at the stations.

Let the sums chosen to compute charges for that portion of the first terminal service of truckage which is rendered at first terminal stations in relation to general merchandise carried in open and in covered wagons, during a period of half a day, be 300*d.* per ton of load, and, during a period of one day, 600*d.* per ton of wagon, including profit. To correct

the weights added on account of empty wagons, let 480*d.* per ton, or four-fifths of 600*d.*, be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of truckage which is rendered at first terminal stations

Let the sums chosen to compute charges for the second terminal service of truckage, rendered in relation to general merchandise carried in open, and in covered wagons, during a period of two days, be 1200*d.* per ton of load and 1200*d.* per ton of wagon, including profit To correct the weights added on account of empty wagons, let 960*d.* per ton, or four-fifths of 1200*d.*, be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of truckage

Let the sum chosen to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations in reference to empty wagons that have carried general merchandise, during a period of one day, be 600*d.* per ton, including profit The weights of wagons carrying loads have been increased by one-fourth to include the conveyance of empty wagons, and, therefore, the sum named is applicable to one-fifth of the increased weights of wagons. To make correction, let 120*d.* per ton, or one-fifth of 600*d.*, be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations

Resulting from the employment of the sums chosen, charges for the first and second terminal services of truckage, rendered in regard to general merchandise carried in open and in covered wagons, are shown in the next Example (pp 106, 107, Ex 5)

## EXAMPLE 5

SOUTH NORTHERN

*General merchandise carried in open and uncovered wagons—Charges*

NOS OF GRADES	7	8	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
1r Distinguishing weights of loads (1)	7½	6½	6¼	5½	5½	4½	4½	3½	3¾	3½
Average weights of wagons (5 tons + 1½ tons for empties)	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
3r Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½	3½	3¾
Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	¾	¾	1	1¾	1¾	1½	1½	1½	1¾	2
Totals	1¾	1¾	2	2½	2¾	2½	2½	2½	2¾	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of truckage, computed at 300d per ton of load	300	300	300	300	300	300	300	300	300	300
And at 480d per ton of wagon	400	432	480	528	576	640	704	784	864	960
Total charges for a portion of the 1st terminal service of truckage	700	732	780	828	876	940	1 004	1 084	1 164	1 260
Charges for the 2nd terminal service of truckage, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 960d per ton of wagon	800	864	960	1 056	1 152	1 280	1 408	1 568	1 728	1 920
Charges for that portion of the 1st terminal service of truckage which is rendered at 2nd terminal stations, computed at 120d per ton of wagon	100	108	120	132	144	160	176	196	216	240
Total charges for the 2nd and a portion of the 1st terminal service of truckage	2 100	2 172	2 280	2 388	2 496	2 640	2 784	2 964	3 144	3 360
Total charges for the 1st and 2nd terminal services of truckage	2 800	2 904	3 060	3 216	3 372	3 580	3 788	4 048	4 308	4 620



RAILWAY COMPANY

*for the first and second terminal services of truckage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{16}$	1	—
$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	$6\frac{1}{4}$	—
$3\frac{1}{8}$	$2\frac{1}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{9}{16}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{9}{16}$	$1\frac{11}{16}$	$1\frac{1}{8}$	$1\frac{1}{16}$	1
$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{9}{16}$	$2\frac{1}{2}$	$2\frac{9}{16}$	$2\frac{9}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$
$3\frac{9}{16}$	$3\frac{1}{2}$	$3\frac{9}{16}$	$3\frac{9}{16}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$4\frac{9}{16}$	$5\frac{9}{16}$	$5\frac{9}{16}$	$6\frac{9}{16}$	$6\frac{9}{16}$	$7\frac{9}{16}$	$7\frac{9}{16}$
Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>
300	300	300	300	300	300	300	300	300	300	300	300	300
1 056	1 152	1 264	1 392	1 536	1 696	1 872	2 064	2 272	2 496	2 736	3 008	3 296
1 356	1 452	1 564	1 692	1 836	1 996	2 172	2 364	2 572	2 796	3 036	3 308	3 596
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
2 112	2 304	2 528	2 784	3 072	3 392	3 744	4 128	4 544	4 992	5 472	6 016	6 592
264	288	316	348	384	424	468	516	568	624	684	752	824
3 576	3 792	4 044	4 332	4 656	5 016	5 412	5 844	6 312	6 816	7 356	7 968	8 616
4 932	5 244	5 608	6 024	6 492	7 012	7 584	8 208	8 884	9 612	10 392	11 276	12 212

## CHAPTER V

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—JUNCTIONAL SERVICES OF STOPPAGE, RAILAGE, HAULAGE, AND TRUCKAGE

MOST railways have trunk-lines and branches ; the places where they meet forming junctions. Each railway serves towns, districts, and villages lying on its route. In the course of business, merchandise is consigned by traders located in the neighbourhood of a station to traders located near another station on the same railway. These two stations may be on the same trunk-line, but widely apart, or they may not be far away from each other. They may, however, be on different trunk-lines or branch-lines, or one may be on a trunk-line and the other on a branch-line. Although it is desirable that merchandise should be taken to its destination without delay, a little reflection will show that it is virtually impossible to convey wagons from the first to the second terminal stations directly, or without interruption, in all circumstances. For the sake of economy as well as convenience, it is arranged for trains to run, daily, on allotted sections of a railway, detaching and attaching wagons at terminal stations on the route, and, when one or both terminal stations are on other sections, which is frequently the case, detaching and attaching wagons at intervening junctions or other appointed places of transfer.

The stoppage of a train to deposit wagons in the sidings connected with a junction, at the end of the first stage of their journey, is, necessarily, followed by the stoppage of another train to attach the same wagons preparatory to the next stage of their journey. During the stay of wagons at intermediate places, the services of railage, haulage, and truckage, are rendered as at terminal stations, but do not continue for so long a period. The wagons, whether loaded or empty, left by trains at such places, require to be put in order and placed at the entrance to sidings in order to facilitate removal by the succeeding trains.

In many instances, the first and second terminal stations are so distant from each other, or their connection by railway is so indirect—as, for example, when situated on different branch-lines—that wagons have

to be transferred at two, three, and even more junctions before a journey is completed. At each place of transfer two services of stoppage are performed, and, while the wagons are awaiting removal, single services of railage, haulage, and truckage, are rendered. It will be convenient to call them junctional services to distinguish them from terminal services.

Junctions and other places of transfer are often terminal stations as well, and, consequently, a service of stoppage may be, and often is, both a terminal and a junctional service, according as the wagons respectively attached and detached at such places begin and end a journey, or begin and end an intermediate stage of a journey.

If all places, forming the beginning and end of journeys, were stations provided by railway companies, the junctional services of stoppage, railage, haulage, and truckage, might be treated as services supplementary to terminal services of the same denomination, and the charges for terminal services might be increased so as to include the cost of junctional services. But, in many instances, terminal places are private sidings belonging to traders, and the terminal services of railage and haulage at such places are fulfilled by traders. Inasmuch as the services of railage and haulage are rendered by railway companies at junctions and other appointed places of transfer whether the terminal places are stations or private sidings, it is necessary to compute charges for them separately from terminal services of the same denomination. In these circumstances, it is deemed expedient to compute charges for the junctional services of stoppage and truckage also separately from terminal services of the same name.

Between some large stations, and especially when one of them serves a port-town, the amount of traffic is so great that full train-loads are provided, daily, for conveyance. Between large stations and some small stations, full train-loads of merchandise are frequently, or occasionally, furnished by traders. At some private sidings full train-loads of coal are provided daily, each train-load having one destination, and, naturally, there is a daily return of empty wagons from the same places to the private sidings. In such circumstances, a railway company should arrange for wagons to be conveyed, uninterruptedly, to their respective destinations whenever it is possible to do so, even though the route be circuitous, since this procedure tends to diminish cost and accelerates the transport of merchandise. It shall be supposed that much the larger portion of merchandise is conveyed, uninterruptedly, to its destination, and that a smaller part arrives there by stages; remaining, temporarily, at appointed places on the way.

It would be a difficult matter to establish charges for junctional services so as to apply only to merchandise in relation to which the services were rendered. Even if the task could be accomplished, such a mode of procedure would, probably, prove to be unacceptable to traders.

Although, therefore, junctional services are fulfilled in reference to a part only of merchandise, it is advisable that charges for the services should be apportioned so as to apply, equally, to all merchandise

With reference to merchandise of every description, conveyed to its destination by stages, it is requisite that the periods of time during which wagons remain, loaded or empty, at junctions and other places of transfer should be ascertained and recorded. From the information thus obtained, the average period of time during which wagons, loaded or empty, remain at an intervening place of transfer, may be correctly calculated.

In order to elucidate the subject and show how it should be dealt with in fairness to all parties, let it be supposed, firstly, that loaded and empty wagons, weighing 1000 tons, are conveyed from first to second terminal stations by two stages, or that services are rendered at one junction, forming an intervening place of transfer. Secondly, let it be assumed that loaded and empty wagons, weighing 1000 tons, are conveyed from first to second terminal stations by three stages, or that services are fulfilled at two junctions. Thirdly, let it be supposed that loaded and empty wagons, weighing 1000 tons, are conveyed from first to second terminal stations by four stages, or that services are performed at three junctions. The charges for services rendered at two junctions may be assumed to be double the charges for services fulfilled at one junction, and for services performed at three junctions, treble the charges for services rendered at one junction. If, however, the weights of loaded and empty wagons be doubled and trebled, respectively, and computation effected by means of the charges for services fulfilled at one junction, the amount obtained in one case will be the same as the amount obtained in the other. Thus, in the second of the three instances supposed, charges for services rendered at two junctions, in relation to loaded and empty wagons weighing 1000 tons may be regarded as equivalent to charges for services rendered at one junction in relation to 2000 tons, and, in the third instance, charges for services fulfilled at three junctions, in relation to loaded and empty wagons weighing 1000 tons, may be considered as equivalent to charges for services fulfilled at one junction in relation to 3000 tons

In the three instances employed for illustration, loaded and empty wagons, weighing 1000 tons, are assumed to be conveyed from first to second terminal stations by two, three, and four stages, respectively, incurring charges for junctional services according to the number of intervening places at which the wagons are transferred. But by increasing the weights of loaded and empty wagons conveyed to their destination by three and four stages, respectively, so that 2000 tons become 5000 tons, and by adding 5000 tons to 1000 tons, the weight of loaded and empty wagons conveyed to their destination by two stages, a total

weight of 6000 tons in place of 3000 tons is obtained, charges for which may be calculated as if junctional services were performed at only one place of transfer, instead of at one, two, and three places of transfer

Let it be supposed that the weights of loaded and empty wagons conveyed from first to second terminal stations by two or more stages, respectively, are separately ascertained and recorded, periodically, and, by proceeding in the manner indicated, that all journeys of more than two stages are reduced to journeys of two stages. The outcome will be an increased weight of loaded and empty wagons in regard to which, charges for services fulfilled at one junction may be computed; and the increased weight may, with propriety, be substituted for the actual or unincreased weights of loaded and empty wagons conveyed by two or more stages, respectively, to their destinations

Obtained in the manner described, let the total weight of loaded and empty wagons deemed to be received, temporarily, at a junction or an appointed place of transfer in the process of conveyance, be one-fifth of the total weight of loaded and empty wagons conveyed from first to second terminal stations, and let the charges for junctional services be apportioned so as to apply, equally, to merchandise comprised in every division of traffic.

In calculating the cost of junctional services, the expenses to be taken into account are identical with those of terminal services of the same denomination.

Let it be assumed that the cost of stopping to transfer loaded and empty wagons at a junction is equal to the cost of stopping to transfer loaded and empty wagons at a terminal station.

The sum that has been chosen to calculate charges, including taxes and profit, for one terminal service of stoppage is 1 200*d*. per ton of load and wagon, and for two services, 2 400*d*. per ton of load and wagon. Charges for two junctional services of stoppage are to be apportioned to the total weight of loads and wagons conveyed, although they are assumed to be incurred in relation to one-fifth only of that weight. Instead of reducing the weights of loads and wagons by four-fifths, it will be more convenient to alter, in a corresponding degree, the sum to be employed as a factor with the weights. Therefore, let 480*d*. per ton, or one-fifth of 2 400*d*., be employed as a factor with the unaltered weights of loads and wagons to calculate charges, including taxes and profit, applicable to merchandise in each division of traffic, for two junctional services of stoppage

Let it be supposed that the average length of time that wagons remain in the sidings at junctions and other places of transfer, awaiting removal, is half a day.

Let it be assumed that the junctional services of railage, haulage, and truckage, in proportion to the length of time during which they are fulfilled, are respectively equal in value to the terminal services of railage,

## EXAMPLE 6

SOUTH NORTHERN

*General merchandise carried in open and in covered wagons—Charges for*

Nos OF GRADES	7	8	9	10	11	12	13	14	15
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A1.</b> Distinguishing weights of loads (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 1½ tons for empties)	6½	6½	6½	6½	6½	6½	6½	6½	6½
<b>B1</b> Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	¾	¾	1	1 ⅙	1 ⅙	1 ⅙	1 ⅙	1 ⅙	1 ⅙
Totals	1 ⅙	1 ⅙	2	2 ⅙	2 ⅙	2 ⅙	2 ⅙	2 ⅙	2 ⅙
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for two junctional services of stoppage, computed at 480d per ton of load	480	480	480	480	480	480	480	480	480
And at 480d per ton of wagon	400	432	480	528	576	640	704	784	864
Total charges for two junctional services of stoppage, including taxes	880	912	960	1 008	1 056	1 120	1 184	1 264	1 344
Charges for the junctional service of rallage, computed at 030d per ton of load	030	030	030	030	030	030	030	030	030
And at 030d per ton of wagon	025	027	030	033	036	040	044	049	054
Total charges for the junctional service of rallage, including taxes	055	057	060	063	066	070	074	079	084
Charges for the junctional service of haulage, computed at 060d per ton of load	060	060	060	060	060	060	060	060	060
And at 060d per ton of wagon	050	054	060	066	072	080	088	098	108
Total charges for the junctional service of haulage	110	114	120	126	132	140	148	158	168
Charges for the junctional service of truckage, computed at 060d per ton of load	060	060	060	060	060	060	060	060	060
And at 060d per ton of wagon	050	054	060	066	072	080	088	098	108
Total charges for the junctional service of truckage	110	114	120	126	132	140	148	158	168
Total charges for junctional services, including taxes	1 155	1 197	1 260	1 323	1 386	1 470	1 554	1 659	1 764

## RAILWAY COMPANY

*the junctional services of stoppage, raiage, haulage, and truckage*

16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1	—
6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	—
3½	3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1
6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2½	2½	2½	2½	3½	3½	3½	4½	4½	5½	5½	6½	6½
3	3½	3½	3½	3½	4½	4½	4½	5½	5½	6½	6½	7½	7½
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
480	480	480	480	480	480	480	480	480	480	480	480	480	480
960	1 056	1 152	1 264	1 392	1 536	1 696	1 872	2 064	2 272	2 496	2 736	3 008	3 296
1 440	1 536	1 632	1 744	1 872	2 016	2 176	2 352	2 544	2 752	2 976	3 216	3 488	3 776
030	030	030	030	030	030	030	030	030	030	030	030	030	030
060	066	072	079	087	096	106	117	129	142	156	171	188	206
090	096	102	109	117	126	136	147	159	172	186	201	218	236
060	060	060	060	060	060	060	060	060	060	060	060	060	060
120	132	144	158	174	192	212	234	258	284	312	342	376	412
180	192	204	218	234	252	272	294	318	344	372	402	436	472
060	060	060	060	060	060	060	060	060	060	060	060	060	060
120	132	144	158	174	192	212	234	258	284	312	342	376	412
180	192	204	218	234	252	272	294	318	344	372	402	436	472
1 890	2 016	2 142	2 289	2 457	2 646	2 856	3 087	3 339	3 612	3 906	4 221	4 578	4 956

haulage, and truckage. The sums that have been chosen to compute charges, including taxes and profit, for the last-named services, are as follows.—

Terminal service of railage 300*d.* per ton of load and wagon, per day.

"	"	haulage	600 <i>d.</i>	"	"	"	"
"	"	truckage	600 <i>d.</i>	"	"	"	"

The sums, therefore, to compute charges, including taxes and profit, for junctional services of the same denomination, rendered in regard to one-fifth of the total weights of loads and wagons during half a day, will be as follows.—

Junctional service of railage 150*d.* per ton of load and wagon, per half-day.

"	"	haulage	300 <i>d.</i>	"	"	"	"
"	"	truckage	300 <i>d.</i>	"	"	"	"

Instead of reducing the weights of loads and wagons by four-fifths for the purpose of apportioning the charges, it will be more convenient to let the weights remain unaltered, and to lessen, in a corresponding degree, the sums to be employed as factors with the weights. Accordingly, the sums to be used as factors with the unaltered weights of loads and wagons in order to compute charges, including taxes and profit, applicable to merchandise in each division of traffic, for the junctional services of railage, haulage, and truckage, will be one-fifth of the sums last-mentioned, stated as follows.—

Junctional service of railage 030*d.* per ton of load and wagon, per half-day.

"	"	haulage	060 <i>d.</i>	"	"	"	"
"	"	truckage	060 <i>d.</i>	"	"	"	"

Resulting from the employment of the respective sums mentioned, charges for the junctional services of stoppage, railage, haulage, and truckage, fulfilled in regard to general merchandise carried in open and in covered wagons, are shown in the last Example (pp 112, 113, Ex. 6).



## CHAPTER VI

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—FIRST AND SECOND TERMINAL SERVICES OF PORTERAGE

THE service of portorage consists, principally, in the labour of individuals employed to load and unload railway wagons at stations. The work is performed by hand or by means of cranes or other instruments. It includes, also, a part of the labour required to load and unload carts and other vehicles, appointed to carry merchandise between stations and traders' places of business. Consignments of merchandise should, if possible, be transferred directly from the vehicles in which they have been conveyed from senders, to the railway wagons selected to receive them. If, for any reason, immediate transfer cannot take place, the goods have to remain in the vehicles or be placed on stages or wharfs until empty wagons are provided. Conversely, direct transfer of merchandise to road vehicles is desirable when loaded wagons have been conveyed by railway and await discharge.

Single consignments that furnish full loads may, in most cases, be directly transferred between road vehicles and railway wagons, and a large part of merchandise is dealt with in this manner. With regard, however, to small packages which are consigned by traders in a town to individuals in different towns and districts, or which, after being conveyed by railway, arrive at a station to be delivered to various consignees in a town or district, it is necessary to use a stage in the warehouse for their temporary reception, in order that they may be sorted and put in readiness for transfer to the vehicles appointed to carry them. For similar and other reasons, it is sometimes needful to act in the same manner with respect to consignments of larger magnitude, including full loads. Naturally, this procedure causes extra handling of merchandise.

Briefly defined, the operation of loading railway wagons consists in lifting goods from the vehicles, stages, or wharfs, where they happen to be placed, and their stowage in the wagons chosen to receive them. The operation of unloading reverses the process, goods having to be lifted from the railway wagons and transferred to vehicles, stages, or wharfs, as may be convenient or necessary.

When a loaded wagon requires to be covered with a tarpaulin, the labour of sheeting must be looked upon as forming a part of the service of loading, and the subsequent duty of taking off the cover must be considered to be a part of the service of unloading. The folding and unfolding of tarpaulins, and their transfer to and from the sheet-bench, must also be viewed as pertaining to the service of portage. Generally, the cost of sheeting and unsheeting loaded wagons is affected but little by the dimensions of loads. If one tarpaulin suffice, a low load may be covered or uncovered a little more quickly than a high load, but the difference between the two is so slight that the operations may be deemed to occupy equal periods of time. The closing and opening of the doors of loaded vans correspond to the covering and uncovering of loaded wagons, though the time occupied in executing the former duties is less than that required to accomplish the latter. The binding of loads with ropes and chains, and the subsequent unbinding, pertain to the services of loading and unloading equally with the services of covering and uncovering.

In loading railway wagons it is often necessary to pack as great a quantity of goods as possible in the loading space provided by each vehicle, and the task calls for the exercise of skill on the part of loaders. Faulty stowage of goods sometimes occasions the use of a greater number of wagons than is actually needful, which adds considerably to the cost of transport. Frequently, foremen have to select wagons to match the kinds and quantities of merchandise that require to be carried. To perform this duty satisfactorily, good judgment is requisite.

Articles of general merchandise are packed in various ways for conveyance, and are also tendered without being packed, or loose. Bags, bales, boxes, bundles, cans, casks, crates, hampers, jars, parcels, sacks, skips, tins, and tubs, describe some of the receptacles or forms in which goods are packed for transport. A large part of general merchandise is not packed, a portion requiring the use of light instruments or merely the employment of the hands to lift it in and out of wagons; and another portion, consisting of heavy single articles, needs the aid of cranes to accomplish transfer. The various ways in which goods are packed, and the condition existent when they are not packed, separately affect the facilities afforded in the operations of loading and unloading wagons.

The various shapes, sizes, and other peculiar features of the articles composing general merchandise, occasion differences in the cost, per ton, of the service of portage. Some kinds of merchandise are light, fragile, and easily damaged, so that they need to be handled with great care. Compared with other kinds, more time is required, and, consequently, more expense is incurred in connection with their stowage in wagons, and their transfer from wagons to vehicles, stages, or wharfs, after conveyance. Consignments of different kinds of general merchandise,

in each division of traffic, that furnish full loads or loads less than full loads, whose weights are alike, will, of course, pertain to the same grade, but the cost of handling them may be expected to differ, and, in some instances, to differ considerably, by reason of the diverse character of the merchandise, the manner in which it is packed, or owing to the circumstance that it is loose, or not packed. Since only one charge, per ton of load, in relation to each grade, may be established for a service of portorage, it is requisite that the cost of handling should be averaged, in order that the charges, per ton of load, calculated for the service of portorage, relating to the grades allotted to general merchandise forming the first and second divisions of traffic, may equitably measure the expenses incurred.

Goods tendered by traders for conveyance are accompanied by consignment notes which respectively contain a description of the articles consigned, with the number, marks, weight, destination, and other information which it is necessary to supply. On receipt, the goods are checked with the entries in the consignment notes, examined to see that they are in good order and condition, and notes made of discrepancies or damages, if any. Foremen are usually entrusted with the performance of these duties. They also label wagons, and enter their Nos. in the consignment notes for the information of invoice clerks. A similar procedure takes place when wagons are discharged. The number and description of the articles forming the loads are compared with the entries in the invoices, and notes made of discrepancies and damages, if any.

Railway companies occasionally weigh consignments of merchandise, and compare the weights obtained with the weights entered in the consignment notes, to be assured of their correctness. If all consignments of goods had to be weighed at stations, the task would necessitate a considerable expenditure of labour, and it might be found advisable to compute charges, separately, for the service. It is, however, only in a limited number of cases that consignments are weighed for the sake of verification. A part of the duty consists in transferring the articles to and from the weighing machines, and a part in recording the weights as they are obtained. Machines sufficiently large to weigh loaded railway wagons and road vehicles, and small enough to weigh parcels and light packages, are provided for the purpose, and the duty may be performed at the first or the second terminal station, as may be convenient. In some instances, consignors omit to furnish the weights of goods, and, in order to ascertain the amounts chargeable for transport, the railway company is then obliged to fulfil the duty of weighing.

The service of portorage is not performed by railway companies with regard to coal, minerals, and analogous merchandise, nor with respect to merchandise in any division of traffic when conveyed between private

sidings ; yet consignments of all kinds of merchandise, without exception, need to be weighed occasionally, either for comparison with the consignors' weights, or for the purpose of calculating the amounts chargeable for transport. Seeing that the labour of weighing merchandise consists partly of the service of portage and partly of the service of clerkage, and in view of the circumstance that the latter service is performed by railway companies in relation to all kinds of merchandise, which cannot be said of the former service, it is expedient that the duty of weighing should be joined to the service of clerkage in the calculation of charges.

The cost, per ton, of loading and unloading wagons, is influenced by the magnitudes of the loads furnished by single consignments. If a full load of any kind of merchandise, consisting of separate articles, were divided into two loads and placed in two wagons instead of one, the cost of loading and unloading, per ton, would be increased. The reason for this is not far to seek. To effect the loading of a wagon, a part of the men's time is occupied in preparing for the task and in completing it. For example, the floor of a vehicle occasionally needs sweeping to render it fit for the reception of goods. Frequently, a wagon requires to be moved a few feet or a few inches to come within convenient reach of a crane. When loads have to be covered with tarpaulins, the sheeting of each loaded wagon may be presumed to occupy an equal period of time. The binding of loads with ropes or chains may also be supposed to take up, in each case, an equal length of time. Moreover, the wagons to be successively loaded are often situated at some distance from each other, and, consequently, porters expend a part of their time in walking from one wagon to the next in the fulfilment of their duties. Services of a similar character, some of which might be described as suppletive duties, are performed in connection with the discharge of wagons. It follows that the smaller the weight of load provided by a consignment of any kind of merchandise, the greater is the cost, per ton, of the service of portage ; or, that the cost, per ton, of loading and unloading wagons, is least when relating to full loads provided by single consignments.

The preparatory and concluding duties associated with the operations of loading and unloading wagons, relating to general merchandise carried in open and in covered wagons, respectively, may be presumed to occupy, in their performance, equal periods of time, and, therefore, to have equal values, regardless of the weights of the loads. Manifestly, the employment of a sum as a factor with the unit-weights of loads only, would yield amounts incorrectly measuring the cost of portage. But by employing two sums, one as a factor with the unit-weights of loads and one as a factor with the weights of wagons proportioned to the unit-weights of loads—excluding the weights added on account of empty wagons by correcting in the same manner as before—an efficient means is provided for regulating, in any degree that may be deemed just, the

charges, per ton of load, for the service of portorage. Amounts, per distinguishing weight of load, calculated by means of charges, per ton of load, will vary according to the different weights of loads distinguishing the grades. Amounts, per distinguishing weight of load, calculated by means of charges, per ton of wagon, will be alike, practically, because the weights of wagons, joined with the distinguishing weights of loads, are the same for each grade. By separately increasing or decreasing the sums employed as factors with the unit-weights of loads and proportionate weights of wagons, the advance of charges, per ton of load, from grade to grade, beginning with the initial grade, may be regulated as may be desired.

In computing the cost of the terminal services of portorage, or the employment of men, and the use of power and machinery in the operations of loading and unloading wagons, generally, at stations, the expenses to be taken into account are as follows —

1 Wages and salaries of porters, cranemen, foremen, and superintendents.

2. Consumption of fuel, water, etc., in the production of power.

3. Consumption of stores, as oil, etc.

4 Incidental repairs of cranes, and other means provided for hoisting merchandise, including loose instruments, as hand-trucks, hooks, chains, slings, etc., due to wear.

5 Allowance for the replacement of cranes and instruments used for lifting and handling purposes, when worn-out or when deemed necessary (Depreciation of cranes, etc.)

6 Suppletive services

In addition, provision must be made for profit on the capital invested in cranes and other instruments used as aids in performing the service of portorage.

Let it be assumed that the first and second terminal services of portorage are of equal value.

Let the sums chosen to compute charges for each terminal service of portorage, performed in relation to general merchandise carried in open and in covered wagons, be 3 000*d* per ton of load and 1 500*d* per ton of wagon carrying the load, including profit. The weights of wagons have been increased by one-fourth to include the conveyance of empties. To correct the weights added on account of empty wagons, let 1 200*d*, or four-fifths of 1 500*d*, be employed as a factor with the unaltered weights of wagons in computing charges for each terminal service of portorage.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of portorage, performed in regard to general merchandise carried in open and in covered wagons, are shown in the next Example (pp 120, 121, Ex. 7)

## EXAMPLE 7

SOUTH NORTHERN

*General merchandise carried in open and in covered wagons—Charges*

NOS OF GRADES	7	8	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>Ai</b> Distinguishing weights of loads (1)	7½	6¾	6½	5¾	5½	4¾	4½	3¾	3½	3¼
Average weights of wagons (5 tons + 1½ tons for empties)	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
<b>Bi</b> Distinguishing weights of loads (2)	—	7½	6¾	6½	5¾	5½	4¾	4½	3¾	3½
Average weights of wagons (5½ tons + 1½ tons for empties)	—	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	¾	¾	1	1¾	1¾	1¾	1¾	1¾	1¾	2
Totals	1¾	1¾	2	2¾	2¾	2¾	2¾	2¾	2¾	3
Charges for the 1st terminal service of portorage, computed at 3 000d per ton of load	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
And at 1 200d per ton of wagon	1 000	1 080	1 200	1 320	1 440	1 600	1 760	1 960	2 160	2 400
Total charges for the 1st terminal service of portorage	4 000	4 080	4 200	4 320	4 440	4 600	4 760	4 960	5 160	5 400
Charges for the 2nd terminal service of portorage, computed at 3 000d per ton of load	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
And at 1 200d per ton of wagon	1 000	1 080	1 200	1 320	1 440	1 600	1 760	1 960	2 160	2 400
Total charges for the 2nd terminal service of portorage	4 000	4 080	4 200	4 320	4 440	4 600	4 760	4 960	5 160	5 400
Total charges for the 1st and 2nd terminal services of portorage	8 000	8 160	8 400	8 640	8 880	9 200	9 520	9 920	10 320	10 800

## RAILWAY COMPANY

*for the first and second terminal services of portage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{17}{20}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{9}{20}$	$1\frac{9}{20}$	$1\frac{11}{40}$	$1\frac{3}{8}$	$1\frac{9}{20}$	$1\frac{1}{10}$	$1\frac{1}{2}$	$1\frac{1}{10}$	1	—
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	—
$3\frac{1}{8}$	$2\frac{17}{20}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{9}{20}$	$1\frac{11}{20}$	$1\frac{11}{20}$	$1\frac{3}{8}$	$1\frac{9}{20}$	$1\frac{1}{10}$	$1\frac{1}{2}$	$1\frac{1}{10}$	1
$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{6}{20}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{7}{20}$	$3\frac{9}{20}$	$3\frac{1}{10}$	$3\frac{7}{20}$	$4\frac{9}{20}$	$4\frac{9}{20}$	$5\frac{6}{20}$	$5\frac{3}{10}$	$6\frac{9}{20}$	$6\frac{9}{20}$
$3\frac{6}{20}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{7}{20}$	$4\frac{9}{20}$	$4\frac{1}{10}$	$4\frac{7}{20}$	$5\frac{9}{20}$	$5\frac{9}{20}$	$6\frac{6}{20}$	$6\frac{3}{10}$	$7\frac{9}{20}$	$7\frac{3}{10}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
2 640	2 880	3 160	3 480	3 840	4 240	4 680	5 160	5 680	6 240	6 840	7 520	8 240
5 640	5 880	6 160	6 480	6 840	7 240	7 680	8 160	8 680	9 240	9 840	10 520	11 240
3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
2 640	2 880	3 160	3 480	3 840	4 240	4 680	5 160	5 680	6 240	6 840	7 520	8 240
5 640	5 880	6 160	6 480	6 840	7 240	7 680	8 160	8 680	9 240	9 840	10 520	11 240
11 280	11 760	12 320	12 960	13 680	14 480	15 360	16 320	17 360	18 480	19 680	21 040	22 480

## CHAPTER VII

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—FIRST AND SECOND TERMINAL SERVICES OF CLERKAGE

AFTER goods have been received from traders and placed in wagons ready for conveyance, a written description of the contents is required for the guidance of men appointed to superintend the operations of unloading at the stations to which the wagons are to be forwarded. Other information needs to be given, each document forming an invoice, and containing particulars under the following headings —

Names of the forwarding and receiving stations (first and second terminal stations)

No of the wagon containing the goods.

Name of the consignor.

Name and address of the consignee.

Number of the articles, with a description of the goods and marks, if any.

Weight of the goods

Rate and charges combined, per ton of load.

Amount chargeable for carriage

NOTE.—When two or more weights and amounts are entered in an invoice, the figures in the respective columns are added together to form totals

The amount for carriage may be paid by the consignor or the consignee, both modes of defrayment being practised by traders in reference to most descriptions of traffic. To provide for either event, each form of invoice is furnished with two columns suitably prepared, the first for "Amounts paid," and the second for "Amounts to pay." "Amounts paid" are collected at first terminal stations, and "Amounts to pay" at second terminal stations. When the necessary particulars have been entered, the invoices are first press-copied and then sent to the receiving stations. By this procedure, copies of the invoices are retained at first terminal stations, and the invoices themselves remain,



permanently, at second terminal stations. Much of the subsequent service of clerkage relates to the information contained in these documents.

Immediate payments for carriage refer only to a minor part of merchandise. To firms who have a large or even a moderate amount of business, it is found convenient to render accounts for carriage periodically (a month is the usual time). This course of procedure requires details of goods carried for each firm to be entered in a ledger, the transmission of an account at stated periods, and the subsequent collection of the amount owing. Railway companies do not allow discount on amounts chargeable for carriage.

Any two stations between which merchandise is conveyed are, reciprocally, first and second terminal stations. From each station returns are sent, monthly, to the principal offices of the railway company, of the total weights and amounts entered in the invoices received from, and in the copies of the invoices sent to, the other station. This procedure creates a system of double entry, each of the two stations being expected to send identical returns in relation to the same traffic, one describing it as *forwarded*, and the other as *received*. Should these returns not agree, an event that sometimes occurs, the staff at the chief offices where the returns are received communicates with the staff at each of the two stations, finds out the cause of the disagreement, and makes correction.

Number-taking, or the recording of the Nos of wagons arriving at, and departing from, stations, invoicing and the calculating of amounts chargeable for carriage, checking calculations, entering in delivery-books, ledgers, and cash-books, taking receipts for goods, collecting amounts due and paying wages, letter-writing, telegraphing, and telephoning, making periodical returns in relation to the different divisions of traffic; preparing suitable balance-sheets; and auditing, are the principal duties forming the service of clerkage.

A part of the service of clerkage is the work executed at the chief offices of the railway company, where returns of various kinds, having reference to the different divisions of traffic, are received, periodically, from each station, and, after comparison and correction, if need be, are summarized, and the totals, under their respective designations, included in the reports of the directors, which are printed and issued to the shareholders half-yearly. These reports show, from term to term, the receipts and expenditure relating to capital and traffic, respectively, and profit or loss. Statements, abstracts, and estimates, referring to departmental expenditure, declaration of dividend, and other information pertaining to the business of a railway company, are also contained in each report.

It is requisite that the periods of time during which loaded wagons

remain at stations before they are despatched or discharged, and at junctions and other places of transfer waiting to resume their journeys, should be noted and recorded. It is also needful that the weights of wagons should be entered in the invoices and form a part of the returns equally with the weights of the loads which they carry. Similar information should be obtained with regard to empty wagons, and their movements from station to station, with their weights, ought to be registered in a form resembling, in some respects, that of an invoice. Wagons, whether loaded or empty, in movement or at rest, are a cause of expense equally with loads, and it is essential that their weights, journeys, and periods of continuance at stations, junctions, and other places, should be methodically recorded by clerks, in order that cost may be correctly calculated. Moreover, it is only by adopting measures of this description that injudicious choice of wagons to carry loads, needless journeys of empty wagons, and undue detention of vehicles, can be brought into view, and that steps can be taken to check or prevent such occurrences.

Railway wagons and road vehicles, containing loads, are occasionally weighed on machines placed in suitable positions near to offices; the weights—gross, tare, and net—being duly registered by clerks. Light consignments of general merchandise are usually weighed by foremen, assisted by porters, on small machines in the warehouses. Although the labour of weighing merchandise is shared in by porters, carters, and others, besides clerks, it will be convenient, for reasons already stated, to regard the performance of this duty as pertaining wholly to the service of clerkage.

The work of book-keeping has no fixed relation to the weights of loads and wagons. Assuming that only one entry is required for each invoice, a consignment of merchandise weighing one cwt will require as much time to set down the particulars of it as a consignment weighing one ton. If goods, forming one consignment, occupy several wagons, the Nos. of the wagons have to be stated in the invoice, and recorded in the wagon-books, occasioning a little additional expenditure of time. When a number of small packages, intended for various consignees in the same town, are entered in one invoice, although the usual details are indispensable in each case, yet, since the invoice has only one total of weights and amounts paid or to pay, the subsequent clerical labour is lessened in some degree.

Admitting that no method of calculating the cost of the service of clerkage can be devised that will have the effect of adjusting it, accurately, to the work performed in relation to each consignment of merchandise, it is practicable to apportion it by proceeding in the same manner as with other terminal services. By pursuing this course, which is advisable in the circumstances, and which is a method of equality of

treatment, a sum may, with propriety, be employed as a factor with the weights of loads and wagons to compute charges for the terminal service of clerkage

In computing the cost of the terminal services of clerkage, or the work of book-keeping and its attendant duties performed by railway clerks in reference to merchandise comprised in each division of traffic, the expenses to be taken into account are as follows —

- 1 Wages and salaries of clerks and superintendents at stations.
- 2 Wages and salaries of clerks and superintendents at the chief offices of the railway company.
- 3 Consumption of stores, as gas, coal, stationery, etc., cost of postage, etc.
- 4 Incidental repairs of office-buildings, fittings, furniture, weighing-machines, instruments of communication, etc., due to wear.
5. Allowance for the rebuilding of offices, the replacement of fittings, furniture, weighing-machines, instruments of communication, etc, when worn-out or when deemed necessary (Depreciation of office-buildings, fittings, etc).

In addition, provision must be made for profit on the capital invested in office-buildings, fittings, and other requisites

Let it be supposed that the weights of wagons, as well as the weights of loads which they carry, are entered in the invoices, and that the journeys of loaded and empty wagons, the length of time during which they remain, alternately loaded and empty, at stations and at intermediate places of transfer, together with other information relating to expenditure, are suitably recorded.

Let it be assumed that the first and second terminal services of clerkage are of equal value.

Let the sum chosen to compute charges, inclusive of profit, for each terminal service of clerkage, performed in reference to general merchandise carried in open and in covered wagons, be 750*d.* per ton of load and wagon, including the weight of empty wagons conveyed.

Resulting from the employment of the sum chosen as a factor with the weights of loads and wagons, charges for the first and second terminal services of clerkage, performed in regard to general merchandise carried in open and in covered wagons, are shown in the following Example (pp. 126, 127, Ex 8)

## EXAMPLE 8

SOUTH NORTHERN

*General merchandise carried in open and in covered*

NOS OF GRADES		7	8	9	10	11	12	13	14	15	16
		Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A.	Distinguishing weights of loads . . (1)	7½	6¾	6¼	5⅝	5¼	4⅝	4½	3¾	3⅞	3⅝
	Average weights of wagons (5 tons + 1¼ tons for empties)	6¼	6¼	6¼	6¼	6¼	6¼	6¼	6½	6½	6¼
B.	Distinguishing weights of loads . . (2)	—	7½	6¾	6¼	5⅝	5¼	4⅝	4½	3¾	3⅞
	Average weights of wagons (5½ tons + 1⅝ tons for empties)	—	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾	6¾
Unit-weights of loads		1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons		¾	¾	1	1⅝	1⅝	1⅝	1⅝	1⅝	1⅝	2
Totals		1⅝	1⅝	2	2⅝	2⅝	2⅝	2⅝	2⅝	2⅝	3
		Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
	Charges for the 1st terminal service of clerage, computed at 750¢ per ton of load	750	750	750	750	750	750	750	750	750	750
	And at 750¢ per ton of wagon	625	675	750	825	900	1 000	1 100	1 225	1 350	1 500
Total charges for the 1st terminal service of clerage		1 375	1 425	1 500	1 575	1 650	1 750	1 850	1 975	2 100	2 250
	Charges for the 2nd terminal service of clerage, computed at 750¢ per ton of load	750	750	750	750	750	750	750	750	750	750
	And at 750¢ per ton of wagon	625	675	750	825	900	1 000	1 100	1 225	1 350	1 500
Total charges for the 2nd terminal service of clerage		1 375	1 425	1 500	1 575	1 650	1 750	1 850	1 975	2 100	2 250
Total charges for the 1st and 2nd terminal services of clerage		2 750	2 850	3 000	3 150	3 300	3 500	3 700	3 950	4 200	4 500

## RAILWAY COMPANY

*wagons—Charges for the first and second terminal services of clerkage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1	—
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	—
$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1
$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$	$6\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$
$3\frac{3}{8}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
750	750	750	750	750	750	750	750	750	750	750	750	750
1 650	1 800	1 975	2 175	2 400	2 650	2 925	3 225	3 550	3 900	4 275	4 700	5 150
2 400	2 550	2 725	2 925	3 150	3 400	3 675	3 975	4 300	4 650	5 025	5 450	5 900
750	750	750	750	750	750	750	750	750	750	750	750	750
1 650	1 800	1 975	2 175	2 400	2 650	2 925	3 225	3 550	3 900	4 275	4 700	5 150
2 400	2 550	2 725	2 925	3 150	3 400	3 675	3 975	4 300	4 650	5 025	5 450	5 900
4 800	5 100	5 450	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900	11 800

## CHAPTER VIII

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—RISK—TAXES—EXTRANEOUS SERVICES (LIABILITIES AND OBLIGATIONS)

HOWEVER carefully conducted, the conveyance of merchandise by railway is attended with danger. Ordinarily, damage to goods is caused by breakage, friction, the action of moisture, etc., and loss of goods by leakage, pilfering, etc., occurring in the course of transport. The outbreak of fire has the effect of damaging or destroying goods. Some of these events are due to faulty stowage of articles in wagons and some to imperfect covering of loads. Collisions between trains, owing to errors of drivers or signalmen, or to the advent of dense fogs, are frequently the occasion of damage and loss in relation to merchandise, vehicles, and permanent way. Hidden flaws in wheels, axles, or other important parts of machinery, become sources of danger when trains are in rapid motion. Atmospheric disturbances, as tempests, floods, occasioned by heavy falls of rain, and lightning, are sometimes the cause of mishaps to trains and injury to property at stations, resulting in damage to merchandise and railway plant. Valuable merchandise requires the exercise of more than ordinary care in the processes of handling and stowing it, and, when the value is great, it may be necessary to take special precautions to ensure its safe transport.

Every source of expenditure should be noted and provided for in the calculation of charges for the service to which it pertains, but when this duty has been performed there still remains the need to compute charges for risk to cover loss sustained in spite of all the care that may be taken to secure the safe transport of merchandise.

Taken from the Annual Reports prepared by the officials of the Board of Trade, the following Table contains the weights of minerals (chiefly coal) and general merchandise conveyed, the receipts from minerals, general merchandise, and live stock; and the amounts paid as compensation for damage to, or loss of, goods, on all the railways in the United Kingdom in the years 1882 to 1905, inclusive, are as follows.—

Years	Weights of minerals	Weights of general merchandise	Total weights of minerals and general merchandise	Receipts from minerals	Receipts from general merchandise	Receipts from live stock	Total receipts	Sum paid as compensation for damage to, or loss of, goods
	Tons	Tons	Tons	£	£	£	£	£
1882	181,410,511	74,595,322	255,915,833	15,606,425	20,836,739	1,282,907	37,726,071	204,088
1883	189,485,612	76,897,356	266,382,968	16,255,421	21,248,487	1,172,446	38,676,354	197,941
1884	183,615,556	75,712,330	259,327,886	15,526,056	20,879,968	1,237,780	37,646,404	202,400
1885	183,776,745	73,511,709	257,288,454	15,242,230	20,382,164	1,242,813	36,871,207	181,305
1886	181,941,397	72,668,061	254,609,458	15,027,428	20,022,409	1,319,486	36,369,323	169,955
1887	193,255,200	75,671,684	268,926,884	15,645,209	20,401,168	1,293,484	37,339,861	169,633
1888	201,576,616	80,171,823	281,748,439	16,158,881	21,239,841	1,357,058	37,555,780	165,850
1889	211,802,561	85,691,952	297,494,513	17,052,167	22,694,358	1,339,868	39,746,525	183,498
1890	215,765,273	87,341,545	303,106,818	17,543,300	23,300,107	1,376,975	40,843,377	220,001
1891	221,528,258	88,780,420	310,308,678	18,064,304	23,776,089	1,390,324	41,860,417	237,804
1892	221,072,764	88,470,607	309,543,371	17,845,462	23,679,670	1,341,366	41,525,132	280,820
1893	207,836,308	85,454,493	293,290,801	16,420,743	23,209,208	1,364,686	39,694,637	245,244
1894	234,313,253	90,102,969	324,416,222	18,116,918	23,803,846	1,458,314	41,920,762	230,154
1895	240,365,505	93,805,426	334,170,931	18,176,535	24,450,682	1,407,668	42,574,217	232,487
1896	254,671,184	101,796,825	356,468,009	18,939,796	25,991,425	1,343,114	44,930,885	271,169
1897	266,912,800	107,469,466	374,382,266	19,746,560	26,736,973	1,372,939	46,475,335	315,088
1898	267,778,462	110,784,623	378,563,085	20,256,373	27,583,188	1,379,271	47,839,654	307,402
1899	266,611,190	117,011,835	383,623,025	21,834,477	28,861,220	1,421,297	50,695,797	415,380
1900	306,389,083	118,540,430	424,929,513	22,870,604	29,165,108	1,434,762	52,035,766	517,050
1901	298,030,044	117,922,797	415,952,841	22,227,150	29,383,116	1,355,303	51,580,266	551,529
1902	320,061,196	116,551,439	436,612,635	23,483,969	29,700,970	1,433,620	53,184,639	483,807
1903	343,699,416	100,007,531	443,697,947	25,351,022	28,280,281	1,479,370	53,631,393	436,001
1904	349,551,616	100,285,909	449,837,525	25,671,851	28,314,995	1,413,206	53,986,846	401,692
1905	358,075,839	103,003,184	461,079,023	26,273,014	28,749,911	1,388,664	55,022,925	381,459
	5,929,518,049	2,242,279,826	8,171,797,875	459,333,585	592,601,923	32,656,661	1,084,592,169	7,077,757

In the settlement of claims, the greater part of the amount paid as compensation relates to general merchandise forming the first and second divisions of traffic. Some kinds of general merchandise are very susceptible of injury, while other kinds are much less liable to receive harm in the course of transport. It would, therefore, be just and proper to form subdivisions of traffic, as might be deemed necessary, to correspond with the different degrees of risk attending the conveyance of the various descriptions of general merchandise. This procedure, however, implies the preparation of a separate Table of united rates and charges for each subdivision, since different sums would have to be made use of to calculate the charges for risk. To facilitate illustration, and for no other purpose, in the next Example the sum to be employed as a factor with the weights of loads will be chosen as if all descriptions of merchandise were equally subject to loss or damage in the course of transport. By this arrangement, the charges computed for risk will apply, uniformly, to merchandise in every division of traffic.

The amount annually expended in the repairs and renewals of locomotives, wagons, permanent way, and other property belonging to railway companies, when damaged or destroyed through accidents, is not given in the Reports issued by the Board of Trade, and, probably, railway companies do not furnish the information. It will, undoubtedly, be a considerable sum, and it is quite as necessary to ascertain and record it, in order to calculate appropriate charges for risk, as to perform the same duty with regard to merchandise. In the absence of figures showing the annual cost of damage to railway plant, attributable to accidents, it will be needful to estimate it by choosing what may be considered a suitable sum to be used as a factor with the weights of wagons to compute charges for risk, having regard, solely, to locomotives, wagons, permanent way, and railway property generally.

Let the sums chosen to compute charges for risk in relation to general merchandise, carried in open and in covered wagons, be 180*d* per ton of load, and 120*d* per ton of wagon, including the weights of empty wagons conveyed.

Taxes imposed by Parliament and by local authorities which railway companies are obliged to pay, come to, a very large amount. It is expedient that the rates and charges, referring exclusively to the services of railage, should be suitably increased in order to provide for the defrayment of taxes. Therefore, having regard to merchandise comprised in each division of traffic, the respective sums to be employed as factors with the weights of loads and wagons to calculate those portions of the rates for conveyance that refer to the interterminal service of railage, and to compute charges for the terminal and junctional services of railage, and for the terminal and junctional services of stoppage so far as concerns the service of railage, which forms a part of them, should be



of sufficient magnitude to yield amounts for the payment of taxes in addition to amounts needed for the various services of railage.

Before steps can be taken to construct a public railway, either long or short, it is necessary for the promoters of the scheme to approach the legislature in a prescribed form, furnishing plans and needful information, and giving public notice of their intention. The legislature then proceeds to appoint a committee, consisting of a limited number of its members, to receive evidence given by individuals on behalf of the promoters, and also by others, styled objectors, who may consider that their interests will be adversely affected if the project be sanctioned. Frequently, the objectors are railway companies themselves, who are naturally opposed to the construction of another railway in districts which they already serve. The duty of the committee is to ascertain if the proposed railway will be of public utility or otherwise, and to report to Parliament accordingly, after which the promoters obtain the requisite authority or the scheme is rejected. Both promoters and objectors usually employ counsel to lay their views before Parliamentary committees. This method of procedure is considered best for the public welfare, though it appears to be costly.

The investigation of other matters in connection with railways is entrusted to Parliamentary committees, before whom experts in various professions are called on to give their opinions, and subjected to examination by individual members of the committees.

Parliament also authorizes the Board of Trade, acting through certain of its officials, to inquire into the cause of every serious railway accident, and to make other investigations that are deemed to be of public importance. \* At these inquiries, witnesses give evidence bearing on the matters that may be in question.

Disputes between railway companies and traders occasionally arise, and courts of law, arbitrations, and conciliatory means are made use of to effect a settlement of them. Doubtless, there are other obligatory duties, though not necessarily pertaining to law, that require to be performed, and which are a source of expense. •

Parliamentary investigations, public inquiries, legal processes, and other ordained methods of action impose on railway companies the performance of duties separate from those constituting their ostensible business. These duties may be called, for distinction, extraneous services, the cost of which must be computed in the same careful manner as other services. It may be assumed that extraneous services are rendered on behalf of all traffic, and, therefore, the same sum, per ton of load and wagon, may, with propriety, be employed to compute charges for these services in regard to merchandise comprised in each division of traffic.

Let the sum chosen to compute charges for extraneous services,

rendered in relation to general merchandise carried in open and in covered wagons, be 060 $\text{d}$  per ton of load and wagon, including the weight of empty wagons conveyed.

Resulting from the employment of the sums chosen as factors with the weights of loads and wagons, charges for risk and extraneous services, respectively, applicable to general merchandise carried in open and in covered wagons, are shown in the next Example (Ex 9).

## EXAMPLE 9

SOUTH NORTHERN RAILWAY COMPANY

*General merchandise carried in open and in covered wagons—Charges for risk and extraneous services*

Nos of GRADES		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
1	Distinguishing weights of loads	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
	Average weights of wagons (5 tons + 1½ tons for empties)	7½	6½	6½	5½	5½	4½	4½	3½	3½	3½	2½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1½
2	Distinguishing weights of loads	—	7½	6½	6½	5½	4½	4½	3½	3½	3½	2½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1½
	Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Proportionate weights of wagons		2½	4½	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Totals		I 2½	I 4½	2	2 2½	2 2½	2 1½	2 1½	2 1½	2 1½	3	3 2½	3 1½	3 1½	3 1½	3 1½	4 1½	4 1½	4 1½	5 1½	5 1½	6 1½	6 1½	7 1½
Charges for risk, computed at 180¢ per ton of load		Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
And at 120¢ per ton of wagon		180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180	180
Total charges for risk . . . . .		100	108	120	132	144	160	176	196	216	240	264	288	316	348	384	424	468	516	568	624	684	752	824
Charges for extraneous services, computed at 60¢ per ton of load		280	288	300	312	324	340	356	376	396	420	444	468	496	528	564	604	648	696	748	804	864	932	1 004
And at 60¢ per ton of wagon		060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060	060
Total charges for extraneous services		030	054	060	066	072	080	088	098	108	120	132	144	158	174	192	212	234	258	284	312	342	376	412
Total charges for extraneous services		110	114	120	126	132	140	148	158	168	180	192	204	218	234	252	272	294	318	344	372	402	436	472

## CHAPTER IX

### SOUTH NORTHERN RAILWAY COMPANY

GENERAL MERCHANDISE (*continued*)—CHARGES FOR TERMINAL AND JUNCTIONAL SERVICES, LIABILITIES, AND OBLIGATIONS, AND RATES FOR CONSECUTIVE DISTANCES, SHOWN SEPARATELY AND UNITEDLY

RISK, taxes, and extraneous services, constituting liabilities and obligations, conclude the account of expenditure ordinarily incurred in relation to merchandise comprised in all the divisions of traffic when conveyed by one railway company only.

Rates, per ton of load, for conveyance 1 mile, have already been calculated (Ex 1). It is now requisite to compute rates for consecutive distances, commencing with 1 mile, the initial distance, and to exhibit them, firstly, as numbered scales of rates alone, and, secondly, by joining them to the total charges for terminal and junctional services, liabilities, and obligations, as numbered scales of united rates and charges

Consecutive distances may be established by adding the initial distance to each successive distance, and this mode of fixing them might prove to be the most satisfactory to all parties. It would, however, necessitate the use of a very large number of rates, some of which, in the lower grades, after disposing of fractions of a penny, would be identical for two consecutive distances. Purely for the sake of lessening the number of rates, it may be found acceptable to increase, at reasonable intervals, the rate of progression in fixing consecutive distances, using only multiples of the initial distance for the purpose, and conditional on the principle of equity being maintained in the process

To illustrate the course suggested, in the Examples about to follow let the distances extend from 1 to 200 miles. Let the rate of progression from 1 to 15 miles be one mile, corresponding with the initial distance, a scale of rates being calculated for each consecutive distance. From 15 to 65 miles let the rate of progression be increased from one mile to two miles, the scale of rates calculated for the first mile of the added two miles, applying to each consecutive distance. From 65 to 200 miles let

the rate of progression be increased from two miles to three miles, the scale of rates calculated for the second mile of the added three miles, applying to each consecutive distance

It may be observed that if the initial distance were a fraction of a mile, or a mile and a fraction, the procedure would be identical with that adopted for whole miles

A complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to general merchandise carried in open and in covered wagons, is given in Example 10, the first of the three Examples immediately following. Reference to the No. of the Example whence the charges have been taken is entered opposite the name of each description of service, liability, and obligation

In Example 11, suitably numbered scales of rates, per ton of load, stated in pence and fractions of a penny, are entered opposite the consecutive distances to which they refer, the rate of progression being increased after 15 miles, from one mile to two miles, and after 65 miles, from two miles to three miles, in the manner chosen for illustration. At the head of the respective columns are entered the total charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, taken from Example 10.

Example 12 constitutes a complete Table (Table I) of Rates and Charges, per ton of load, for general merchandise carried in open and in covered wagons, forming the first and second divisions of traffic. It is prepared by adding together the rates and charges, contained in Example 11, to form scales of united rates and charges, per ton of load, stated in shillings and pence, together with the consecutive distances, embracing 1 to 200 miles, to which they refer. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence. It may be observed that this mode of dealing with fractions of a penny, together with the circumstance that the fractional weights of wagons joined with the unit-weights of loads have not, in some cases, precisely the same ratios as the weights of wagons and loads to which they respectively relate, create inequalities, but they are not of great importance.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be calculated and entered so as to form a part of the contents of the Tables, in the manner shown in the Example. In an illustrative work of this kind, a few instances will suffice to show the advantage derivable from the procedure.



## RAILWAY COMPANY

*for terminal and junctional services, liabilities, and obligations*

16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	1 $\frac{9}{10}$	1 $\frac{9}{10}$	1 $\frac{3}{4}$	1 $\frac{9}{10}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{9}{10}$	1	—
5	5	5	5	5	5	5	5	5	5	5	5	5	—
1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	—
6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	—
3 $\frac{9}{10}$	3 $\frac{1}{5}$	2 $\frac{7}{10}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{9}{10}$	1 $\frac{9}{10}$	1 $\frac{9}{10}$	1 $\frac{3}{4}$	1 $\frac{9}{10}$	1 $\frac{3}{4}$	1 $\frac{1}{5}$	1 $\frac{1}{10}$	1
5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$
1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$
6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$	6 $\frac{7}{8}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2 $\frac{6}{10}$	2 $\frac{1}{2}$	2 $\frac{9}{10}$	2 $\frac{7}{10}$	3 $\frac{1}{10}$	3 $\frac{6}{10}$	3 $\frac{7}{10}$	4 $\frac{9}{10}$	4 $\frac{2}{10}$	5 $\frac{6}{10}$	5 $\frac{9}{10}$	6 $\frac{3}{10}$	6 $\frac{9}{10}$
3	3 $\frac{9}{10}$	3 $\frac{2}{10}$	3 $\frac{9}{10}$	3 $\frac{7}{10}$	4 $\frac{3}{10}$	4 $\frac{6}{10}$	4 $\frac{7}{10}$	5 $\frac{9}{10}$	5 $\frac{2}{10}$	6 $\frac{9}{10}$	6 $\frac{1}{10}$	7 $\frac{9}{10}$	7 $\frac{2}{10}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
7 200	7 680	8 160	8 720	9 360	10 080	10 880	11 760	12 720	13 760	14 880	16 080	17 440	18 880
2 310	2 466	2 622	2 804	3 012	3 246	3 506	3 792	4 104	4 442	4 806	5 196	5 638	6 106
4 620	4 932	5 244	5 608	6 024	6 492	7 012	7 584	8 208	8 884	9 612	10 392	11 276	12 212
4 620	4 932	5 244	5 608	6 024	6 492	7 012	7 584	8 208	8 884	9 612	10 392	11 276	12 212
1 440	1 536	1 632	1 744	1 872	2 016	2 176	2 352	2 544	2 752	2 976	3 216	3 488	3 776
090	096	102	109	117	126	136	147	159	172	186	201	218	236
180	192	204	218	234	252	272	294	318	344	372	402	436	472
180	192	204	218	234	252	272	294	318	344	372	402	436	472
10 800	11 280	11 760	12 320	12 960	13 680	14 480	15 360	16 320	17 360	18 480	19 680	21 040	22 480
4 500	4 800	5 100	5 450	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900	11 800
420	444	468	496	528	564	604	648	696	748	804	864	932	1 004
180	192	204	218	234	252	272	294	318	344	372	402	436	472

## EXAMPLE II

SOUTH NORTHERN

*General merchandise carried in open and in covered wagons—Rates for consecutive*

NOS OF GRADES		7	8	9	10	11	12	13	14
A.	Distinguishing weights of loads (1)	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
	Average weights of wagons (5 tons + 1½ tons for empties)	7½	6½	6½	5½	5½	4½	4½	3½
B.	Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½
	Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads		I	I	I	I	I	I	I	I
Proportionate weights of wagons		¾	¾	I	I	I	I	I	I
Totals		I ¾	I ¾	2	2 ¾	2 ¾	2 ¾	2 ¾	2 ¾
Ref to the Nos of Examples	Total charges for terminal and junctional services, liabilities, and obligations	23 695	24 429	25 530	26 631	27 732	29 200	30 668	32 503
I	Rates for the initial distance, including taxes	55	57	60	63	66	70	74	79

Rates of progression	Consecutive distances		Nos of scales		Scales of rates							
1 mile	Not exceeding 1 mile		1		55	57	60	63	66	70	74	79
	Over 1 mile and not exceeding 2 miles		2		1 10	1 14	1 20	1 26	1 32	1 40	1 48	1 58
	" 2 "	" 3 "	3		1 65	1 71	1 80	1 89	1 98	2 10	2 22	2 37
	" 3 "	" 4 "	4		2 20	2 28	2 40	2 52	2 64	2 80	2 96	3 16
	" 4 "	" 5 "	5		2 75	2 85	3 00	3 15	3 30	3 50	3 70	3 95
	" 5 "	" 6 "	6		3 30	3 42	3 60	3 78	3 96	4 20	4 44	4 74
	" 6 "	" 7 "	7		3 85	3 99	4 20	4 41	4 62	4 90	5 18	5 53
	" 7 "	" 8 "	8		4 40	4 56	4 80	5 04	5 28	5 60	5 92	6 32
	" 8 "	" 9 "	9		4 95	5 13	5 40	5 67	5 94	6 30	6 66	7 11
	" 9 "	" 10 "	10		5 50	5 70	6 00	6 30	6 60	7 00	7 40	7 90
	" 10 "	" 11 "	11		6 05	6 27	6 60	6 93	7 26	7 70	8 14	8 69
	" 11 "	" 12 "	12		6 60	6 84	7 20	7 56	7 92	8 40	8 88	9 48
	" 12 "	" 13 "	13		7 15	7 41	7 80	8 19	8 58	9 10	9 62	10 27
	" 13 "	" 14 "	14		7 70	7 98	8 40	8 82	9 24	9 80	10 36	11 06
	" 14 "	" 15 "	15		8 25	8 55	9 00	9 45	9 90	10 50	11 10	11 85
2 miles	" 15 "	" 17 "	16		8 80	9 12	9 60	10 08	10 56	11 20	11 84	12 64
	" 17 "	" 19 "	18		9 90	10 26	10 80	11 34	11 88	12 60	13 32	14 22
	" 19 "	" 21 "	20		11 00	11 40	12 00	12 60	13 20	14 00	14 80	15 80
	" 21 "	" 23 "	22		12 10	12 54	13 20	13 86	14 52	15 40	16 28	17 38
	" 23 "	" 25 "	24		13 20	13 68	14 40	15 12	15 84	16 80	17 76	18 96
	" 25 "	" 27 "	26		14 30	14 82	15 60	16 38	17 16	18 20	19 24	20 54
	" 27 "	" 29 "	28		15 40	15 96	16 80	17 64	18 48	19 60	20 72	22 12
	" 29 "	" 31 "	30		16 50	17 10	18 00	18 90	19 80	21 00	22 20	23 70
	" 31 "	" 33 "	32		17 60	18 24	19 20	20 16	21 12	22 40	23 68	25 28
	" 33 "	" 35 "	34		18 70	19 38	20 40	21 42	22 44	23 80	25 16	26 86
	" 35 "	" 37 "	36		19 80	20 52	21 60	22 68	23 76	25 20	26 64	28 44
	" 37 "	" 39 "	38		20 90	21 66	22 80	23 94	25 08	26 60	28 12	30 02
	" 39 "	" 41 "	40		22 00	22 80	24 00	25 20	26 40	28 00	29 60	31 60
	" 41 "	" 43 "	42		23 10	23 94	25 20	26 46	27 72	29 40	31 08	33 18
	" 43 "	" 45 "	44		24 20	25 08	26 40	27 72	29 04	30 80	32 56	34 76



## RAILWAY COMPANY

*distances and total charges for terminal and junctional services, habits, and obligations*

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons 3 $\frac{3}{8}$	Tons 3 $\frac{3}{8}$	Tons 2 $\frac{1}{2}$	Tons 2 $\frac{3}{8}$	Tons 2 $\frac{3}{8}$	Tons 2 $\frac{3}{8}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons 1 $\frac{1}{2}$	Tons —
6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	—
3 $\frac{3}{8}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1
6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$
1 1 $\frac{3}{8}$	1 2	1 2 $\frac{3}{8}$	1 2 $\frac{3}{8}$	1 2 $\frac{3}{8}$	1 2 $\frac{3}{8}$	1 3 $\frac{3}{8}$	1 3 $\frac{3}{8}$	1 3 $\frac{3}{8}$	1 4 $\frac{3}{8}$	1 4 $\frac{3}{8}$	1 5 $\frac{3}{8}$	1 5 $\frac{3}{8}$	1 6 $\frac{3}{8}$	1 6 $\frac{3}{8}$
2 $\frac{3}{8}$	3	3 $\frac{3}{8}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$	4 $\frac{3}{8}$	4 $\frac{3}{8}$	4 $\frac{3}{8}$	5 $\frac{3}{8}$	5 $\frac{3}{8}$	6 $\frac{3}{8}$	6 $\frac{3}{8}$	7 $\frac{3}{8}$	7 $\frac{3}{8}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
34 338	36 540	38 742	40 944	43 513	46 449	49 752	53 422	57 459	61 863	66 634	71 772	77 277	83 516	90 122
84	90	96	1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18	2 36

per ton of load

84	90	96	1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18	2 36
1 68	1 80	1 92	2 04	2 18	2 34	2 52	2 72	2 94	3 18	3 44	3 72	4 02	4 36	4 72
2 52	2 70	2 88	3 06	3 27	3 51	3 78	4 08	4 41	4 77	5 16	5 58	6 03	6 54	7 08
3 36	3 60	3 84	4 08	4 36	4 68	5 04	5 44	5 88	6 36	6 88	7 44	8 04	8 72	9 44
4 20	4 50	4 80	5 10	5 45	5 85	6 30	6 80	7 35	7 95	8 60	9 30	10 05	10 90	11 80
5 04	5 40	5 76	6 12	6 54	7 02	7 56	8 16	8 82	9 54	10 32	11 16	12 06	13 08	14 16
5 88	6 30	6 72	7 14	7 63	8 19	8 82	9 52	10 29	11 13	12 04	13 02	14 07	15 26	16 52
6 72	7 20	7 68	8 16	8 72	9 36	10 08	10 88	11 76	12 72	13 76	14 88	16 08	17 44	18 88
7 56	8 10	8 64	9 18	9 81	10 53	11 34	12 24	13 23	14 31	15 48	16 74	18 09	19 62	21 24
8 40	9 00	9 60	10 20	10 90	11 70	12 60	13 60	14 70	15 90	17 20	18 60	20 10	21 80	23 60
9 24	9 90	10 56	11 22	11 99	12 87	13 86	14 96	16 17	17 49	18 92	20 46	22 11	23 98	25 96
10 08	10 80	11 52	12 24	13 08	14 04	15 12	16 32	17 64	19 08	20 64	22 32	24 12	26 16	28 32
10 92	11 70	12 48	13 26	14 17	15 21	16 38	17 68	19 11	20 67	22 36	24 18	26 13	28 34	30 68
11 76	12 60	13 44	14 28	15 26	16 38	17 64	19 04	20 58	22 26	24 08	26 04	28 14	30 52	33 04
12 60	13 50	14 40	15 30	16 35	17 55	18 90	20 40	22 05	23 85	25 80	27 90	30 15	32 70	35 40
13 44	14 40	15 36	16 32	17 44	18 72	20 16	21 76	23 52	25 44	27 52	29 76	32 16	34 88	37 76
15 12	16 20	17 28	18 36	19 62	21 06	22 68	24 48	26 46	28 62	30 96	33 48	36 18	39 24	42 48
16 80	18 00	19 20	20 40	21 80	23 40	25 20	27 20	29 40	31 80	34 40	37 20	40 20	43 60	47 20
18 48	19 80	21 12	22 44	23 98	25 74	27 72	29 92	32 34	34 98	37 84	40 92	44 22	47 96	51 92
20 16	21 60	23 04	24 48	26 16	28 08	30 24	32 64	35 28	38 16	41 28	44 64	48 24	52 32	56 64
21 84	23 40	24 96	26 52	28 34	30 42	32 76	35 36	38 22	41 34	44 72	48 36	52 26	56 68	61 36
23 52	25 20	26 88	28 56	30 52	32 76	35 28	38 08	41 16	44 52	48 16	52 08	56 28	61 04	66 08
25 20	27 00	28 80	30 60	32 70	35 10	37 80	40 80	44 10	47 70	51 60	55 80	60 30	65 40	70 80
26 88	28 80	30 72	32 64	34 88	37 44	40 32	43 52	47 04	50 88	55 04	59 52	64 32	69 76	75 52
28 56	30 60	32 64	34 68	37 06	39 78	42 84	46 24	49 98	54 06	58 48	63 24	68 34	74 12	80 24
30 24	32 40	34 56	36 72	39 24	42 12	45 36	48 96	52 92	57 24	61 92	66 96	72 36	78 48	84 96
31 92	34 20	36 48	38 76	41 42	44 46	47 88	51 68	55 86	60 42	65 36	70 68	76 38	82 84	89 68
33 60	36 00	38 40	40 80	43 60	46 80	50 40	54 40	58 80	63 60	68 80	74 40	80 40	87 20	94 40
35 28	37 80	40 32	42 84	45 78	49 14	52 92	57 12	61 74	66 78	72 24	78 12	84 42	91 56	99 12
36 96	39 60	42 24	44 88	47 96	51 48	55 44	59 84	64 68	69 96	75 68	81 84	88 44	95 92	103 84

EXAMPLE II (continued)

NOS OF GRADES		7	8	9	10	11	12	13	14
A I	Distinguishing weights of loads (1)	Tons 7½	Tons 6½	Tons 6½	Tons 5½	Tons 5½	Tons 4½	Tons 4½	Tons 3½
	Average weights of wagons (5 tons + 1½ tons for empties)	6½	6½	6½	6½	6½	6½	6½	6½
B I.	Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½
	Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½
Unit-weights of loads		I ¾	I ¾	I I	I I¾	I I¾	I I¾	I I¾	I I¾
Proportionate weights of wagons		¾	¾	I	I¾	I¾	I¾	I¾	I¾
Totals		I¾	I¾	2	2¾	2¾	2¾	2¾	2¾
Ref to the Nos of Examples IO	Total charges for terminal and junctional services, liabilities, and obligations	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
		23 695	24 429	25 530	26 631	27 732	29 200	30 668	32 503
I	Rates for the initial distance, including taxes	55	57	60	63	66	70	74	79

Rates of progression	Consecutive distances	Nos of scales	Scales of rates														
2 miles	Over 45 miles and not exceeding 47 miles	46	25 30	26 22	27 60	28 98	30 36	32 20	34 04	36 34							
	" 47 " " " 49 "	48	26 40	27 36	28 80	30 24	31 68	33 60	35 52	37 92							
	" 49 " " " 51 "	50	27 50	28 50	30 00	31 50	33 00	35 00	37 00	39 50							
	" 51 " " " 53 "	52	28 60	29 64	31 20	32 76	34 32	36 40	38 48	41 08							
	" 53 " " " 55 "	54	29 70	30 78	32 40	34 02	35 64	37 80	39 96	42 66							
	" 55 " " " 57 "	56	30 80	31 92	33 60	35 28	36 96	39 20	41 44	44 24							
	" 57 " " " 59 "	58	31 90	33 06	34 80	36 54	38 28	40 60	42 92	45 82							
	" 59 " " " 61 "	60	33 00	34 20	36 00	37 80	39 60	42 00	44 40	47 40							
	" 61 " " " 63 "	62	34 10	35 34	37 20	39 06	40 92	43 40	45 88	48 98							
	" 63 " " " 65 "	64	35 20	36 48	38 40	40 32	42 24	44 80	47 36	50 56							
	3 miles	" 65 " " " 68 "	67	36 85	38 19	40 20	42 21	44 22	46 90	49 58	52 93						
		" 68 " " " 71 "	70	38 50	39 90	42 00	44 10	46 20	49 00	51 80	55 30						
" 71 " " " 74 "		73	40 15	41 61	43 80	45 99	48 18	51 10	54 02	57 67							
" 74 " " " 77 "		76	41 80	43 32	45 60	47 88	50 16	53 20	56 24	60 04							
" 77 " " " 80 "		79	43 45	45 03	47 40	49 77	52 14	55 30	58 46	62 41							
" 80 " " " 83 "		82	45 10	46 74	49 20	51 66	54 12	57 40	60 68	64 78							
" 83 " " " 86 "		85	46 75	48 45	51 00	53 55	56 10	59 50	62 90	67 15							
" 86 " " " 89 "		88	48 40	50 16	52 80	55 44	58 08	61 60	65 12	69 52							
" 89 " " " 92 "		91	50 05	51 87	54 60	57 33	60 06	63 70	67 34	71 89							
" 92 " " " 95 "		94	51 70	53 58	56 40	59 22	62 04	65 80	69 56	74 26							
" 95 " " " 98 "		97	53 35	55 29	58 20	61 11	64 02	67 90	71 78	76 63							
" 98 " " " 101 "		100	55 00	57 00	60 00	63 00	66 00	70 00	74 00	79 00							
" 101 " " " 104 "		103	56 65	58 71	61 80	64 89	67 98	72 10	76 22	81 37							
" 104 " " " 107 "		106	58 30	60 42	63 60	66 78	69 96	74 20	78 44	83 74							
" 107 " " " 110 "		109	59 95	62 13	65 40	68 67	71 94	76 30	80 66	86 11							
" 110 " " " 113 "		112	61 60	63 84	67 20	70 56	73 92	78 40	82 88	88 48							
" 113 " " " 116 "		115	63 25	65 55	69 00	72 45	75 90	80 50	85 10	90 85							
" 116 " " " 119 "		118	64 90	67 26	70 80	74 34	77 88	82 60	87 32	93 22							
" 119 " " " 122 "	121	66 55	68 97	72 60	76 23	79 86	84 70	89 54	95 59								
" 122 " " " 125 "	124	68 20	70 68	74 40	78 12	81 84	86 80	91 76	97 96								

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons $3\frac{1}{2}$	Tons $3\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons 1	Tons —
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	—
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$
$1\frac{1}{2}$	1	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
$2\frac{1}{2}$	3	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
34 338	36 540	38 742	40 944	43 513	46 449	49 752	53 422	57 459	61 863	66 634	71 772	77 277	83 516	90 122
84	90	96	1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18	2 36

per ton of load

38 64	41 40	44 16	46 92	50 14	53 82	57 96	62 56	67 62	73 14	79 12	85 56	92 46	100 28	108 56
40 32	43 20	46 08	48 96	52 32	56 16	60 48	65 28	70 56	76 32	82 56	89 28	96 48	104 64	113 28
42 00	45 00	48 00	51 00	54 50	58 50	63 00	68 00	73 50	79 50	86 00	93 00	100 50	108 00	118 00
43 68	46 80	49 92	53 04	56 68	60 84	65 52	70 72	76 44	82 68	89 44	96 72	104 52	113 36	122 72
45 36	48 60	51 84	55 08	58 86	63 18	68 04	73 44	79 38	85 86	92 88	100 44	108 54	117 72	127 44
47 04	50 40	53 76	57 12	61 04	65 52	70 56	76 16	82 32	89 04	96 32	104 16	112 56	122 08	132 16
48 72	52 20	55 68	59 16	63 22	67 86	73 08	78 88	85 26	92 22	99 76	107 88	116 58	126 44	136 88
50 40	54 00	57 60	61 20	65 40	70 20	75 60	81 60	88 20	95 40	103 20	111 60	120 60	130 80	141 60
52 08	55 80	59 52	63 24	67 58	72 54	78 12	84 32	91 14	98 58	106 64	115 32	124 62	135 16	146 32
53 76	57 60	61 44	65 28	69 76	74 88	80 64	87 04	94 08	101 76	110 08	119 04	128 64	139 52	151 04
56 28	60 30	64 32	68 34	73 03	78 39	84 42	91 12	98 49	106 53	115 24	124 62	134 67	146 06	158 12
58 80	63 00	67 20	71 40	76 30	81 90	88 20	95 20	102 90	111 30	120 40	130 20	140 70	152 60	165 20
61 32	65 70	70 08	74 46	79 57	85 41	91 98	99 28	107 31	116 07	125 56	135 78	146 73	159 14	172 28
63 84	68 40	72 96	77 52	82 84	88 92	95 76	103 36	111 72	120 84	130 72	141 36	152 76	165 68	179 36
66 36	71 10	75 84	80 58	86 11	92 43	99 54	107 44	116 13	125 61	135 88	146 94	158 79	172 22	186 44
68 88	73 80	78 72	83 64	89 38	95 94	103 32	111 52	120 54	130 38	141 04	152 52	164 82	178 76	193 52
71 40	76 50	81 60	86 70	92 65	99 45	107 10	115 60	124 95	135 15	146 20	158 10	170 85	185 30	200 60
73 92	79 20	84 48	89 76	95 92	102 96	110 88	119 68	129 36	139 92	151 36	163 68	176 88	191 84	207 68
76 44	81 90	87 36	92 82	99 19	106 42	114 66	123 76	133 77	144 69	156 52	169 26	182 91	198 38	214 76
78 96	84 60	90 24	95 88	102 46	109 98	118 44	127 84	138 18	149 46	161 68	174 84	188 94	204 92	221 84
81 48	87 30	93 12	98 94	105 73	113 49	122 22	131 92	142 59	154 23	166 84	180 42	194 97	211 46	228 92
84 00	90 00	96 00	102 00	109 00	117 00	126 00	136 00	147 00	159 00	172 00	186 00	201 00	218 00	236 00
86 52	92 70	98 88	105 06	112 27	120 51	129 78	140 08	151 41	163 77	177 16	191 58	207 03	224 54	243 08
89 04	95 40	101 76	108 12	115 54	124 02	133 56	144 16	155 82	168 54	182 32	197 16	213 06	231 08	250 16
91 56	98 10	104 64	111 18	118 81	127 53	137 34	148 24	160 23	173 31	187 48	202 74	219 09	237 62	257 74
94 08	100 80	107 52	114 24	122 08	131 04	141 12	152 32	164 64	178 08	192 64	208 32	225 12	244 16	264 32
96 60	103 50	110 40	117 30	125 35	134 55	144 90	156 40	169 05	182 85	197 80	213 90	231 15	250 70	271 40
99 12	106 20	113 28	120 36	128 62	138 06	148 68	160 48	173 46	187 62	202 96	219 48	237 18	257 24	278 48
101 64	108 90	116 16	123 42	131 89	141 57	152 46	164 56	177 87	192 39	208 12	225 06	243 21	263 78	285 56
104 16	111 60	119 04	126 48	135 16	145 08	156 24	168 64	182 28	197 16	213 28	230 64	249 24	270 32	292 64

EXAMPLE II (continued)

NOS OF GRADES		7	8	9	10	11	12	13	14	
Ar.	Distinguishing weights of loads (1)	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	
	Average weights of wagons (5 tons + 1½ tons for empties)	7½	6½	6½	6½	6½	6½	6½	6½	
Br.	Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½	
	Average weights of wagons (5½ tons + 1½ tons for empties)	—	6½	6½	6½	6½	6½	6½	6½	
Unit-weights of loads		1	1	1	1	1	1	1	1	
Proportionate weights of wagons		¾	¾	1	1½	1½	1½	1½	1½	
Totals		1½	1½	2	2½	2½	2½	2½	2½	
Ref to the Nos of Examples 10	Total charges for terminal and junctional services, liabilities, and obligations	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	
I	Rates for the initial distance, including taxes	23 695	24 429	25 530	26 631	27 732	29 200	30 668	32 503	
		55	57	60	63	66	70	74	79	
Rates of progression	Consecutive distances	Scales of rates								
	Nos of scales									
3 miles	Over 125 miles and not exceeding 128 miles	127	69 85	72 39	76 20	80 01	83 82	88 90	93 98	100 33
	128 " " " 131 "	130	71 50	74 10	78 00	81 90	85 80	91 00	96 20	102 70
	131 " " " 134 "	133	73 15	75 81	79 80	83 79	87 78	93 10	98 42	105 07
	134 " " " 137 "	136	74 80	77 52	81 60	85 68	89 76	95 20	100 64	107 44
	137 " " " 140 "	139	76 45	79 23	83 40	87 57	91 74	97 30	102 86	109 81
	140 " " " 143 "	142	78 10	80 94	85 20	89 46	93 72	99 40	105 08	112 18
	143 " " " 146 "	145	79 75	82 65	87 00	91 35	95 70	101 50	107 30	114 55
	146 " " " 149 "	148	81 40	84 36	88 80	93 24	97 68	103 60	109 52	116 92
	149 " " " 152 "	151	83 05	86 07	90 60	95 13	99 66	105 70	111 74	119 29
	152 " " " 155 "	154	84 70	87 78	92 40	97 02	101 64	107 80	113 96	121 66
	155 " " " 158 "	157	86 35	89 49	94 20	98 91	103 62	109 90	116 18	124 03
	158 " " " 161 "	160	88 00	91 20	96 00	100 80	105 60	112 00	118 40	126 40
	161 " " " 164 "	163	89 65	92 91	97 80	102 69	107 58	114 10	120 62	128 77
	164 " " " 167 "	166	91 30	94 62	99 60	104 58	109 56	116 20	122 84	131 14
	167 " " " 170 "	169	92 95	96 33	101 40	106 47	111 54	118 30	125 06	133 51
	170 " " " 173 "	172	94 60	98 04	103 20	108 36	113 52	120 40	127 28	135 88
	173 " " " 176 "	175	96 25	99 75	105 00	110 25	115 50	122 50	129 50	138 25
	176 " " " 179 "	178	97 90	101 46	106 80	112 14	117 48	124 60	131 72	140 62
	179 " " " 182 "	181	99 55	103 17	108 60	114 03	119 46	126 70	133 94	142 99
	182 " " " 185 "	184	101 20	104 88	110 40	115 92	121 44	128 80	136 16	145 36
	185 " " " 188 "	187	102 85	106 59	112 20	117 81	123 42	130 90	138 38	147 73
	188 " " " 191 "	190	104 50	108 30	114 00	119 70	125 40	133 00	140 60	150 10
	191 " " " 194 "	193	106 15	110 01	115 80	121 59	127 38	135 10	142 82	152 47
	194 " " " 197 "	196	107 80	111 72	117 60	123 48	129 36	137 20	145 04	154 84
	197 " " " 200 "	199	109 45	113 43	119 40	125 37	131 34	139 30	147 26	157 21

15	16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons $3\frac{1}{2}$	Tons $3\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons —
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	—
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
$2\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
34 338	36 540	38 742	40 944	43 513	46 449	49 752	53 422	57 459	61 863	66 634	71 772	77 277	83 516	90 122
84	90	96	1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18	2 36

per ton of load

106 68	114 30	121 92	129 54	138 43	148 59	160 02	172 72	186 69	201 93	218 44	236 22	255 27	276 86	299 72
109 20	117 00	124 80	132 60	141 70	152 10	163 80	176 80	191 10	206 70	223 60	241 80	261 30	283 40	306 80
111 72	119 70	127 68	135 66	144 97	155 61	167 58	180 88	195 51	211 47	228 76	247 38	267 33	289 94	313 88
114 24	122 40	130 56	138 72	148 24	159 12	171 36	184 96	199 92	216 24	233 92	252 96	273 36	296 48	320 96
116 76	125 10	133 44	141 78	151 51	162 63	175 14	189 04	204 33	221 01	239 08	258 54	279 39	303 02	328 04
119 28	127 80	136 32	144 84	154 78	166 14	178 92	193 12	208 74	225 78	244 24	264 12	285 42	309 56	335 12
121 80	130 50	139 20	147 90	158 08	169 65	182 70	197 20	213 15	230 55	249 40	269 70	291 45	316 10	342 20
124 32	133 20	142 08	150 96	161 32	173 16	186 48	201 28	217 56	235 32	254 56	275 28	297 48	322 64	349 28
126 84	135 90	144 96	154 02	164 59	176 67	190 26	205 36	221 97	240 09	259 72	280 86	303 51	329 18	356 36
129 36	138 60	147 84	157 08	167 86	180 18	194 04	209 44	226 38	244 86	264 88	286 44	309 54	335 72	363 44
131 88	141 30	150 72	160 14	171 13	183 69	197 82	213 52	230 79	249 63	270 04	292 02	315 57	342 26	370 52
134 40	144 00	153 60	163 20	174 40	187 20	201 60	217 60	235 20	254 40	275 20	297 60	321 60	348 80	377 60
136 92	146 70	156 48	166 26	177 67	190 71	205 38	221 68	239 61	259 17	280 36	303 18	327 63	355 34	384 68
139 44	149 40	159 36	169 32	180 94	194 22	209 16	225 76	244 02	263 94	285 52	308 76	333 66	361 88	391 76
141 96	152 10	162 24	172 38	184 21	197 73	212 94	229 84	248 43	268 71	290 68	314 34	339 69	368 42	398 84
144 48	154 80	165 12	175 44	187 48	201 24	216 72	233 02	252 84	273 48	295 84	319 92	345 72	374 96	405 92
147 00	157 50	168 00	178 50	190 75	204 75	220 50	238 00	257 25	278 25	301 00	325 50	351 75	381 50	413 00
149 52	160 20	170 88	181 56	194 02	208 26	224 28	242 08	261 66	283 02	306 16	331 08	357 78	388 04	420 08
152 04	162 90	173 76	184 62	197 29	211 77	228 06	246 16	266 07	287 79	311 32	336 66	363 81	394 58	427 16
154 56	165 60	176 64	187 68	200 56	215 28	231 84	250 24	270 48	292 56	316 48	342 24	369 84	401 12	434 24
157 08	168 30	179 52	190 74	203 83	218 79	235 62	254 32	274 89	297 33	321 64	347 82	375 87	407 66	441 32
159 60	171 00	182 40	193 80	207 10	222 30	239 40	258 40	279 30	302 10	326 80	353 40	381 90	414 20	448 40
162 12	173 70	185 28	196 86	210 37	225 81	243 18	262 48	283 71	306 87	331 96	358 98	387 93	420 74	455 48
164 64	176 40	188 16	199 92	213 64	229 37	246 96	266 56	288 12	311 64	337 12	364 56	393 96	427 28	462 56
167 16	179 10	191 04	202 98	216 91	232 83	250 74	270 64	292 53	316 41	342 28	370 14	399 99	433 82	469 64

The amounts chargeable for the transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion, in each Table, of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will prove useful, firstly, in preventing clerks from entering wrong amounts in invoices when the circumstances are as described, and, secondly, in saving the labour of calculation with regard to consignments that are full loads or less than full loads, whose weights correspond with the weights of loads employed to distinguish the grades. Under this regulation, consignments of merchandise that are less than full loads and whose weights differ from the weights of loads used to distinguish the grades, will, in some instances, be chargeable with amounts due for loads of greater weight. Allowing that this disposition of procedure tells all in favour of railway companies, the consequent disadvantage to traders will not be great. Moreover, no better way of obviating the difficulty seems feasible. A moderately large number of grades have been made use of for illustration, but if the number were doubled there would still be differences to bridge over, such as described, though they would, of course, be lessened.

## CHAPTER X

### SOUTH NORTHERN RAILWAY COMPANY

#### GENERAL MERCHANDISE (*continued*)—SMALL CONSIGNMENTS

PARCELS and packages forming small consignments of goods are often tendered to railway companies for conveyance, and if the dues for transport were calculated by means of the united rates and charges per ton only, the resulting amounts would be insufficient to cover expenses. For example, computed at 10s. per ton, the amount yielded for 28 lbs. is three-halfpence; for 14 lbs., three-farthings; and for 7 lbs., three-eighths of a penny. It is customary to state the amount chargeable for the carriage of goods in pounds, shillings, and pence, eliminating fractions of a penny. To pursue this course equitably, the rule followed in making calculations is that fractions of a penny amounting to a halfpenny and over are called pence, and when less than a halfpenny are not reckoned. In some instances the amount yielded for the carriage of a parcel weighing only a few pounds, if computed by the agency of a sum per ton, would come to less than a halfpenny, and by following the before-mentioned rule the parcel would be carried free. But even a penny would be inadequate to defray the cost of carrying a parcel weighing several pounds, and it becomes necessary to discover the reason why a greater sum should be charged.

Of the services that have been mentioned and provided for in the Table of United Rates and Charges for general merchandise carried in open and in covered wagons, only two require the institution of minimum charges. These are the services of clerkage and portorage. For all other services, liabilities, and obligations, including conveyance, minimum charges are unnecessary, because the united rates and charges, per ton of load, applied to the weights of small consignments will yield amounts sufficient for all requirements.

Every consignment of goods has to be invoiced, and the amount chargeable for carriage, computed and collected. Averagely, the fulfilment of the duty of invoicing takes less time for a small parcel than for a consignment furnishing a full load. The difference, however, is not great, because the same descriptive details are requisite in each case. The cost of clerkage has been provided for by apportioning it; a sum,

per ton of load and wagon, being employed to compute charges for the service. When the weight of a consignment is small, the amount due for clerkage, obtained by means of a sum, per ton, is correspondingly small, and it is reasonable to suppose that there must be a point in weight at which the amount computed begins to be less than the actual cost of the service.

A small consignment may consist of one or more similar articles that can be entered in one line of the invoice, or of dissimilar articles that take two or more lines to describe. For the sake of economy in the use of wagons, small consignments intended for various stations lying in one direction are often sent, along with other goods, to large or moderately large stations short of their destinations, at which places they are transhipped and reforwarded, along with other goods, to their respective destinations. Consignments that are transhipped have to be briefly described in the invoices sent to, and by, the transshipping stations, which occasions additional clerical labour. Sometimes small consignments have to be weighed, and the duty of weighing pertains to both clerkage and portage. All these things should be taken into account in deciding on the sum which is to form the minimum charge for the service of clerkage.

One sum per ton of load, and another sum per ton of wagon, have been employed to compute charges for the service of portage. When the weight of a consignment is small, the amount for portage, calculated by means of a sum per ton, is correspondingly small, and it is reasonable to assume, as in the case of clerkage, that there must be a point in weight at which the amount computed begins to be less than the actual cost of the service. Lightness, in relation to consignments of merchandise, tends to increase the cost, per ton, of the service of portage. Small parcels and packages consigned to separate individuals, whether located in the same or in different towns, have to be checked and sorted—duties which require time and labour to fulfil. Mistakes are apt to be made if care be not taken in noting the written or printed directions. Consequently, many packages, forming a load, addressed to different individuals, occupy the time of loaders and unloaders to a greater extent than if they were consigned by one person or firm to another. The transshipment of merchandise has reference, generally, to small consignments, and its performance occasions extra handling, increasing the cost of portage. Small consignments of merchandise that need covering occupy the time of porters in the operations of loading and unloading to a greater extent than do consignments of equal number and magnitude that may be carried in open wagons. In deciding on the sum which is to form the minimum charge for the service of portage, expenditure of every kind, however caused, should be noted and taken into account.



Although it is obvious that the institution of minimum charges is requisite in order that the services of clerkage and portrage performed in regard to small consignments may be adequately provided for, it is important that they should be moderate in amount. The choice of reasonable sums as minimum charges is likely of itself to induce traders to make use of railways for the transport of small parcels but there exists a special reason why the sums should not be excessive. When the amount charged for carrying a small consignment by railway includes a considerable sum for profit, a favourable opportunity is afforded to road carriers of making use of railway carriers as agents in the transmission of small parcels. Thus, it enables road carriers who have warehouses, horses, carts, and staffs of men in various large towns to undertake the transport of light parcels between traders established in such towns. In each locality the road carrier collects the parcels from the senders, sorts them, and packs together those designed for the same town. These packages of parcels are then delivered, as somewhat heavy single consignments, to the railway carrier, who has no alternative but to convey them to their several destinations. On arrival, the road carrier, to whom they are consigned, again gets possession of the goods, unpacks and sorts them, after which he proceeds to deliver them by means of his own staff to the respective consignees. Under these conditions, it will be perceived that the profit made by the road carrier is regulated by the amount of profit included in the charge made by the railway carrier for the transport of each parcel or small consignment of goods. If the minimum charges for small parcels be high, the road carrier is enabled to obtain a greater profit; if low, a less profit. For a consignment of packed parcels the railway carrier can charge only an amount calculated by means of a rate combined with charges, per ton of load, for conveyance, terminal services, etc, and a fixed additional sum if the goods come under the designation of a small consignment; and is totally deprived of the several profits which would be receivable if the parcels were singly consigned in the ordinary way.

Let the sum chosen as the minimum charge for a terminal service of clerkage, performed with respect to single consignments of general merchandise carried in open wagons, be one penny, or for the first and second terminal services of clerkage combined, twopence. For these services, calculated in reference to grade 28, the final grade for general merchandise carried in open wagons, 1090 $\frac{1}{2}$  per ton is chargeable (Ex. 10). Computed by means of this sum, a consignment weighing 3 cwts. 2 qrs 19 lbs yields twopence. Consequently, having regard to the first and second terminal services of clerkage, consignments of general merchandise that are carried in open wagons and weigh less than 3 cwts 2 qrs 19 lbs. become small consignments, for which the sum of twopence is to be charged in each case.

Let the sum chosen as the minimum charge for a terminal service of portorage, performed in regard to single consignments of general merchandise carried in open wagons, be one halfpenny, or for the first and second terminal services of portorage combined, one penny. For these services, calculated in reference to grade 28, the final grade for general merchandise carried in open wagons, 21 04*d*. per ton is chargeable (Ex. 10). Computed by means of this sum, a consignment weighing 3 qrs. 23 lbs. yields one penny. Therefore, having regard to the first and second terminal services of portorage, consignments of general merchandise that are carried in open wagons and weigh less than 3 qrs. 23 lbs. become small consignments, for which the sum of one penny is to be charged in each case.

Let the sum chosen as the minimum charge for a terminal service of clerkage, performed with respect to single consignments of general merchandise carried in covered wagons, be one penny, or for the first and second terminal services of clerkage combined, twopence. For these services, calculated in reference to grade 29, the final grade for general merchandise carried in covered wagons, 11 80*d*. per ton is chargeable (Ex. 10). Computed by means of this sum, a consignment weighing 3 cwt. 1 qr. 16 lbs. yields twopence. Therefore, having regard to the first and second terminal services of clerkage, consignments of general merchandise that are carried in covered wagons and weigh less than 3 cwt. 1 qr. 16 lbs. become small consignments, for which the sum of twopence is to be charged in each case.

Let the sum chosen as the minimum charge for a terminal service of portorage, performed in regard to single consignments of general merchandise carried in covered wagons, be three-farthings, or for the first and second terminal services of portorage combined, three-halfpence. For these services, calculated in reference to grade 29, the final grade for general merchandise carried in covered wagons, 22 48*d*. per ton is chargeable (Ex. 10). Computed by means of this sum, a consignment weighing 1 cwt. 1 qr. 10 lbs. yields three-halfpence. Consequently, having regard to the first and second terminal services of portorage, consignments of general merchandise that are carried in covered wagons and weigh less than 1 cwt. 1 qr. 10 lbs. become small consignments, for which the sum of three-halfpence is to be charged in each case.

Thus, the respective sums employed to form minimum charges for the first and second terminal services of clerkage and portorage, fulfilled with regard to single consignments of general merchandise carried in open and in covered wagons, have an influence in determining the weights marking the limits for small consignments. These sums and weights, with the kind of service and the division of traffic to which they severally relate, may be restated as follows—

	LIMITS OF WEIGHT			MINIMUM CHARGES, PER CON- SIGNMENT
	Cwts	qrs	lbs	d.
Consignments of general merchandise carried in open wagons that are to be considered as small, having regard to the first and second terminal services of clerkage—any weights less than . . . . .	3	2	19	2
Consignments of general merchandise carried in open wagons that are to be considered as small, having regard to the first and second terminal services of portorage—any weights less than . . . . .	0	3	23	1
Total minimum charge per consignment, in open wagons . . . . .				<u>3</u>
Consignments of general merchandise carried in covered wagons that are to be considered as small, having regard to the first and second terminal services of clerkage—any weights less than . . . . .	3	1	16	2
Consignments of general merchandise carried in covered wagons that are to be considered as small, having regard to the first and second terminal services of portorage—any weights less than . . . . .	1	1	10	1½
Total minimum charge per consignment, in covered wagons . . . . .				<u>3½</u>

Computed by means of sums, per ton, forming charges appropriate to grades 28 and 29 (Ex. 10) for the first and second terminal services of clerkage and portorage fulfilled with regard to general merchandise carried in open and in covered wagons, respectively, the amounts yielded for small consignments will fall short of the fixed minimum charges, according as the weights of the consignments fall short of the respective limits of weight; thus creating deficiencies of varying magnitude. In order that these deficiencies may be calculated and suitably provided for, it is requisite, first of all, to divide the weight, marking the extreme limit of weight for small consignments into parts having regular intervals, commencing with a small weight and advancing by steps of equal magnitude until the extreme limit of weight is reached or included. These weights may be called divisional weights. Next,

taking general merchandise in each division of traffic into account, separately, it is necessary to compute by means of the before-mentioned sums, per ton the amounts due for the first and second terminal services of clerkage and portorage respectively performed in regard to small consignments whose weights correspond with the divisional weights, and to enter such amounts and the deficiencies created, together with the minimum charges, separately and conjointly, opposite the divisional weights to which they respectively refer. The ultimate object of this procedure is to set forth, for the information of invoice-clerks and traders, the sums, denoting deficiencies, that require to be added to the amounts computed by means of the united rates and charges, per ton, applied to the weights of small consignments

Let the extreme limit of weight for small consignments, 3 cwts. 2 qrs. 19 lbs, be divided into sixteenths of a cwt, beginning with one-sixteenth, or 7 lbs, and advancing by successive sixteenths until the extreme limit of weight becomes included

Let it be made a condition that any consignment weighing less than 7 lbs shall be charged as if weighing 7 lbs, and if weighing more than 7 lbs and not exceeding 14 lbs, as if weighing 14 lbs; and so with regard to each succeeding division of weight. By this stipulation it is intended that the united rates and charges, per ton, when relating to small consignments, shall apply to successive sixteenths of a cwt, and not to intervening weights

Example 13, the first of the three Examples immediately following, refers to general merchandise carried in open wagons, and Example 14 to general merchandise carried in covered wagons. They are designed to show the method of arriving at the sums wanting to make up the minimum charge for the first and second terminal services of clerkage and the minimum charge for the first and second terminal services of portorage, in relation to small consignments whose weights correspond with the divisional weights, the two kinds of service being dealt with separately and conjointly. The sums, marking deficiencies, are first stated in pence and fractions of a penny with two decimal places, and finally, with the object of facilitating subsequent calculations, in pence and farthings; each fraction of a farthing being reckoned as a farthing to guard against loss

In Example 15, on the left and right of the divisional weights, are entered the sums, stated in pence and farthings, marking deficiencies, taken from Examples 13 and 14 respectively, that require to be added to the amounts computed by means of the united rates and charges, per ton, for small consignments of general merchandise carried in open and in covered wagons whose weights pertain to the divisional weights. The whole of the particulars contained in this Example should be sub-joined to the Table of United Rates and Charges for general merchandise

carried in open and in covered wagons (Ex. 12), for the guidance of invoice-clerks and the information of traders.

To guard against the possibility of smaller amounts being charged for consignments that have greater weights than for consignments that have less weights, the two extreme limits of weight for general merchandise, carried in open and in covered wagons respectively, have been slightly extended. By this procedure, it is intended that consignments of each description of general merchandise that pertain to the last division of weight without reaching its limit shall be computed by means of the united rates and charges, per ton, as if possessing the weight marking the limit, no sum for deficiency having to be added on account of the last divisional weight.

## SOUTH NORTHERN RAILWAY COMPANY

*General merchandise carried in open wagons—Mode of arriving at the sums, approximately denoting deficiencies, which are to be added to the amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the first and second terminal services of carriage and portage when performed in regard to small consignments*

## GENERAL MERCHANDISE CARRIED IN OPEN WAGONS (A.)

Divisional weights, to embrace small consignments	Minimum charge for the 1st and 2nd terminal services ( $1d + 1d$ )		Amounts for the 1st and 2nd terminal services of carriage at 100 <sup>wt</sup> per ton (Grade 28, Example 28)		Differences, or amounts between the minimum charge and the amounts calculated		Minimum charge for the 1st and 2nd terminal services ( $\frac{1}{2}d + 1d$ )		Amounts for the 1st and 2nd terminal services, calculated at 21 0 <sup>wt</sup> per ton (Grade 28, Example 28)		Differences, or amounts between the minimum charge and the amounts calculated		Total minimum charge for the 1st and 2nd terminal services and portage ( $1\frac{1}{2}d + 1\frac{1}{2}d$ )		Total deficiencies		Sums, approximately denoting the total deficiencies, to be added to the amounts computed by means of the united rates, and charges, per ton	
	cwt	lbs	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d	d
O O 7	O	O	2	197	O3	I 97	I	O7	I 97	3	93	3	290	3	290	3	290	3
O O 14	O	O	2	I 93	O7	I 93	I	I 3	I 93	3	87	3	280	3	280	3	280	3
O O 21	O	O	2	I 90	I 0	I 90	I	20	I 90	3	80	3	270	3	270	3	270	3
O I O	O	I	2	I 86	I 4	I 86	I	26	I 86	3	74	3	260	3	260	3	260	3
O I 7	O	I	2	I 83	I 7	I 83	I	33	I 83	3	67	3	250	3	250	3	250	3
O I 14	O	I	2	I 80	20	I 80	I	39	I 80	3	61	3	241	3	241	3	241	3
O I 21	O	I	2	I 76	24	I 76	I	46	I 76	3	54	3	230	3	230	3	230	3
O 2 O	O	2	2	I 73	27	I 73	I	53	I 73	3	47	3	220	3	220	3	220	3
O 2 7	O	2	2	I 69	31	I 69	I	59	I 69	3	41	3	210	3	210	3	210	3
O 2 14	O	2	2	I 66	34	I 66	I	66	I 66	3	34	3	200	3	200	3	200	3
O 2 21	O	2	2	I 62	37	I 62	I	72	I 62	3	28	3	190	3	190	3	190	3
O 3 O	O	3	2	I 59	41	I 59	I	79	I 59	3	21	3	180	3	180	3	180	3
O 3 7	O	3	2	I 55	44	I 55	I	85	I 55	3	15	3	170	3	170	3	170	3
O 3 14	O	3	2	I 52	48	I 52	I	92	I 52	3	08	3	160	3	160	3	160	3
O 3 21	O	3	2	I 49	51	I 49	I	99	I 49	3	01	3	150	3	150	3	150	3
I O O	I	O	2	I 46	55	I 46	I	—	I 46	3	—	3	146	3	146	3	146	3
I O 7	I	O	2	I 42	58	I 42	I	—	I 42	3	—	3	142	3	142	3	142	3
I O 14	I	O	2	I 39	61	I 39	I	—	I 39	3	—	3	139	3	139	3	139	3
I O 21	I	O	2	I 35	65	I 35	I	—	I 35	3	—	3	135	3	135	3	135	3
I I O	I	I	2	I 32	68	I 32	I	—	I 32	3	—	3	132	3	132	3	132	3
I I 7	I	I	2	I 28	72	I 28	I	—	I 28	3	—	3	128	3	128	3	128	3
I I 14	I	I	2	I 25	75	I 25	I	—	I 25	3	—	3	125	3	125	3	125	3
I I 21	I	I	2	I 22	78	I 22	I	—	I 22	3	—	3	122	3	122	3	122	3
I 2 O	I	2	2	I 18	82	I 18	I	—	I 18	3	—	3	118	3	118	3	118	3

1	1	2	7	2	85	1 15 1 11 1 08 1 05	1	—	—	—	—	3	1 15 1 11 1 08 1 05	1 1 1 1 1 1 1 1
1	1	3	0	2	99 1 02 1 06 1 09	1 01 98 94 91	1	—	—	—	—	3	1 01 98 94 91	1 1 1 1 1 1 1 1
2	0	7	2	2	1 12 1 16 1 19 1 23	88 84 81 77	1	—	—	—	—	3	88 84 81 77	1 1 1 1
2	1	7	2	2	1 26 1 29 1 33 1 36	74 71 67 64	1	—	—	—	—	3	74 71 67 64	1 1 1 1
2	2	7	2	2	1 40 1 43 1 46 1 50	60 57 54 50	1	—	—	—	—	3	60 57 54 50	1 1 1 1
2	3	7	2	2	1 53 1 57 1 60 1 64	47 43 40 36	1	—	—	—	—	3	47 43 40 36	1 1 1 1
3	0	7	2	2	1 67 1 70 1 74 1 77	33 30 26 23	1	—	—	—	—	3	33 30 26 23	1 1 1 1
3	1	7	2	2	1 81 1 84 1 87 1 91	19 16 13 09	1	—	—	—	—	3	19 16 13 09	1 1 1 1
3	2	7	2	2	1 94 1 98 —	06 02 —	1	—	—	—	—	3	06 02 —	1 1 —

# EXAMPLE 14

SOUTH NORTHERN RAILWAY COMPANY

*General merchandise carried in covered wagons—Mode of arriving at the sums, approximately denoting deficiencies, which are to be added to the amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the first and second terminal services of clearance and portage when performed in regard to small consignments*

GENERAL MERCHANDISE CARRIED IN COVERED WAGONS (B<sub>1</sub>)

Divisional weights to embrace small consignments	Minimum charge for the 1st and 2nd terminal services (1d + 1d')		Amounts for the 1st and 2nd terminal services calculated at 11 80d per ton (Grade 29, Example 10)		Deficiencies, or differences between the amounts calculated and the minimum charge		Minimum charge for the 1st and 2nd terminal services (3 3d + 3 3d')		Amounts for the 1st and 2nd terminal services calculated at 22 48d per ton (Grade 29, Example 10)		Deficiencies, or differences between the amounts calculated and the minimum charge		Total minimum charge for the 1st and 2nd terminal services of clearance and portage (1 3d + 1 3d')		Total deficiencies		Sums, approximately denoting the total deficiencies, to be added to the amounts computed by means of the united rates and charges, per ton	
	cwt	grs	lbs	d	d'	d	d'	d	d'	d	d'	d	d	d'	d	d'	d	d'
O O 7	O	O	7	2	04	1 06	1 3	1 3	07	1 43	1 3	1 43	3 3	3 3	3 30	3 3	3 3	3 3
O O 14	O	O	14	2	07	1 93	1 3	1 3	14	1 36	1 3	1 36	3 3	3 3	3 20	3 3	3 3	3 3
O O 21	O	O	21	2	11	1 89	1 3	1 3	21	1 29	1 3	1 29	3 3	3 3	3 18	3 3	3 3	3 3
O I O	O	I	O	2	15	1 85	1 3	1 3	28	1 22	1 3	1 22	3 3	3 3	3 07	3 3	3 3	3 3
O I 7	O	I	7	2	18	1 82	1 3	1 3	35	1 15	1 3	1 15	3 3	3 3	2 97	3	3	3
O I 14	O	I	14	2	22	1 78	1 3	1 3	42	1 08	1 3	1 08	3 3	3 3	2 86	3	3	3
O I 21	O	I	21	2	26	1 74	1 3	1 3	49	1 01	1 3	1 01	3 3	3 3	2 75	2 1	2 1	2 1
O 2 O	O	2	O	2	30	1 70	1 3	1 3	56	94		94	3 3	3 3	2 64	2 1	2 1	2 1
O 2 7	O	2	7	2	33	1 67	1 3	1 3	63	87		87	3 3	3 3	2 54	2 1	2 1	2 1
O 2 14	O	2	14	2	37	1 63	1 3	1 3	70	80		80	3 3	3 3	2 43	2 1	2 1	2 1
O 2 21	O	2	21	2	41	1 59	1 3	1 3	77	73		73	3 3	3 3	2 32	2 1	2 1	2 1
O 3 O	O	3	O	2	44	1 56	1 3	1 3	84	66		66	3 3	3 3	2 22	2 1	2 1	2 1
O 3 7	O	3	7	2	48	1 52	1 3	1 3	91	59		59	3 3	3 3	2 11	2 1	2 1	2 1
O 3 14	O	3	14	2	52	1 48	1 3	1 3	98	52		52	3 3	3 3	2 00	2	2	2
O 3 21	O	3	21	2	55	1 45	1 3	1 3	1 05	45		45	3 3	3 3	1 90	2	2	2
I O O	I	O	O	2	59	1 41	1 3	1 3	1 12	38		38	3 3	3 3	1 79	2	2	2
I O 7	I	O	7	2	63	1 37	1 3	1 3	1 19	31		31	3 3	3 3	1 68	1 3	1 3	1 3
I O 14	I	O	14	2	66	1 34	1 3	1 3	1 26	24		24	3 3	3 3	1 58	1 3	1 3	1 3
I O 21	I	O	21	2	70	1 30	1 3	1 3	1 33	17		17	3 3	3 3	1 47	1 3	1 3	1 3
I I O	I	I	O	2	74	1 26	1 3	1 3	1 41	09		09	3 3	3 3	1 35	1 3	1 3	1 3



1	1	1	7	2	77	1 23	1 1	1 48	02	3 1	1 25
1	1	1	14	2	81	1 19	1 1	—	—	3 1	1 19
1	1	1	21	2	85	1 15	1 1	—	—	3 1	1 15
1	1	2	0	2	89	1 11	1 1	—	—	3 1	1 11
1	2	2	7	2	92	1 08	1 1	—	—	3 1	1 08
1	1	2	14	2	96	1 04	1 1	—	—	3 1	1 04
1	1	2	21	2	1 00	1 00	1 1	—	—	3 1	1 00
1	1	3	0	2	1 03	97	1 1	—	—	3 1	97
1	3	7	7	2	1 07	93	1 1	—	—	3 1	93
1	1	3	14	2	1 11	89	1 1	—	—	3 1	89
1	1	3	21	2	1 14	86	1 1	—	—	3 1	86
2	2	0	0	2	1 18	82	1 1	—	—	3 1	82
2	0	7	7	2	1 22	78	1 1	—	—	3 1	78
2	0	14	2	2	1 25	75	1 1	—	—	3 1	75
2	0	21	2	2	1 29	71	1 1	—	—	3 1	71
2	1	0	0	2	1 33	67	1 1	—	—	3 1	67
2	1	7	7	2	1 36	64	1 1	—	—	3 1	64
2	1	14	2	2	1 40	60	1 1	—	—	3 1	60
2	1	21	2	2	1 44	56	1 1	—	—	3 1	56
2	2	0	2	2	1 48	52	1 1	—	—	3 1	52
2	2	7	7	2	1 51	49	1 1	—	—	3 1	49
2	2	14	2	2	1 55	45	1 1	—	—	3 1	45
2	2	21	2	2	1 59	41	1 1	—	—	3 1	41
2	2	3	0	2	1 62	38	1 1	—	—	3 1	38
2	3	7	7	2	1 66	34	1 1	—	—	3 1	34
2	3	14	2	2	1 70 <sup>a</sup>	30	1 1	—	—	3 1	30
2	3	21	2	2	1 73	27	1 1	—	—	3 1	27
3	3	0	0	2	1 77	23	1 1	—	—	3 1	23
3	0	7	7	2	1 81	19	1 1	—	—	3 1	19
3	0	14	2	2	1 84	16	1 1	—	—	3 1	16
3	0	21	2	2	1 88	12	1 1	—	—	3 1	12
3	1	0	2	2	1 92	08	1 1	—	—	3 1	08
3	1	7	7	2	1 95	05	1 1	—	—	3 1	05
3	1	14	2	2	1 99	01	1 1	—	—	3 1	01
3	1	21	—	—	—	—	—	—	—	—	—

II

## EXAMPLE 15

SOUTH NORTHERN RAILWAY COMPANY

*General merchandise carried in open and in covered wagons—Divisional weights to embrace small consignments, and, on the left and right of them in relation to the two divisions of traffic, respectively, sums, denoting deficiencies, that require to be added to the amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the first and second terminal services of clerage and portorage when performed in regard to small consignments*

General merchandise carried in open wagons (A1)		General merchandise carried in covered wagons (B1)	General merchandise carried in open wagons (A1)		General merchandise carried in covered wagons (B1)
Sums, denoting deficiencies, that are to be added to amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the 1st and 2nd terminal services of clerage and portorage, performed in regard to small consignments	Divisional weights to embrace small consignments (consignments whose weights come between two divisional weights must be charged for as if having the greater weight)	Sums, denoting deficiencies, that are to be added to amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the 1st and 2nd terminal services of clerage and portorage, performed in regard to small consignments	Sums, denoting deficiencies, that are to be added to amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the 1st and 2nd terminal services of clerage and portorage, performed in regard to small consignments	Divisional weights to embrace small consignments (consignments whose weights come between two divisional weights must be charged for as if having the greater weight)	Sums, denoting deficiencies, that are to be added to amounts computed by means of the united rates and charges, per ton, to make up the total minimum charge for the 1st and 2nd terminal services of clerage and portorage, performed in regard to small consignments
$d$	<i>cwts grs lbs</i>	$d$	$d$	<i>cwts grs lbs</i>	$d$
3	0 0 7	$3\frac{1}{2}$	$1\frac{1}{2}$	1 3 7	1
3	0 0 14	$3\frac{1}{2}$	I	I 3 14	I
$2\frac{3}{4}$	0 0 21	$3\frac{1}{2}$	I	I 3 21	I
$2\frac{3}{4}$	0 I 0	$3\frac{1}{2}$	I	2 0 0	I
$2\frac{1}{2}$	0 I 7	3	I	2 0 7	I
$2\frac{1}{2}$	0 I 14	3	I	2 0 14	
$2\frac{1}{2}$	0 I 21	$2\frac{3}{4}$	I	2 0 21	$2\frac{3}{4}$
$2\frac{1}{4}$	0 2 0	$2\frac{3}{4}$	I	2 I 0	$2\frac{3}{4}$
$2\frac{1}{4}$	0 2 7	$2\frac{3}{4}$	$2\frac{1}{4}$	2 I 7	$2\frac{1}{4}$
2	0 2 14	$2\frac{1}{2}$	$2\frac{1}{4}$	2 I 14	$2\frac{1}{4}$
2	0 2 21	$2\frac{1}{2}$	$2\frac{1}{4}$	2 I 21	$2\frac{1}{4}$
2	0 3 0	$2\frac{1}{4}$	$2\frac{1}{4}$	2 2 0	$2\frac{1}{4}$
$1\frac{3}{4}$	0 3 7	$2\frac{1}{4}$	$2\frac{1}{4}$	2 2 7	$1\frac{3}{4}$
$1\frac{3}{4}$	0 3 14	2	$2\frac{1}{4}$	2 2 14	$1\frac{3}{4}$
$1\frac{1}{2}$	0 3 21	2	$2\frac{1}{4}$	2 2 21	$1\frac{3}{4}$
$1\frac{1}{2}$	I 0 0	2	$2\frac{1}{4}$	2 3 0	$1\frac{1}{2}$
$1\frac{1}{2}$	I 0 7	$1\frac{3}{4}$	$2\frac{1}{4}$	2 3 7	$1\frac{1}{2}$
$1\frac{1}{2}$	I 0 14	$1\frac{3}{4}$	$2\frac{1}{4}$	2 3 14	$1\frac{1}{2}$
$1\frac{1}{2}$	I 0 21	$1\frac{1}{2}$	$2\frac{1}{4}$	2 3 21	$1\frac{1}{2}$
$1\frac{1}{2}$	I I 0	$1\frac{1}{2}$	$2\frac{1}{4}$	3 0 0	$1\frac{1}{2}$
$1\frac{1}{2}$	I I 7	$1\frac{1}{2}$	$2\frac{1}{4}$	3 0 7	$1\frac{1}{2}$
$1\frac{1}{4}$	I I 14	$1\frac{1}{4}$	$2\frac{1}{4}$	3 0 14	$1\frac{1}{4}$
$1\frac{1}{4}$	I I 21	$1\frac{1}{4}$	$2\frac{1}{4}$	3 0 21	$1\frac{1}{4}$
$1\frac{1}{4}$	I 2 0	$1\frac{1}{4}$	$2\frac{1}{4}$	3 I 0	$1\frac{1}{4}$
$1\frac{1}{4}$	I 2 7	$1\frac{1}{4}$	$2\frac{1}{4}$	3 I 7	$1\frac{1}{4}$
$1\frac{1}{4}$	I 2 14	$1\frac{1}{4}$	$2\frac{1}{4}$	3 I 14	$1\frac{1}{4}$
$1\frac{1}{4}$	I 2 21	I	$2\frac{1}{4}$	3 I 21	—
$1\frac{1}{4}$	I 3 0	I	—	3 2 0	—
				3 2 7	—
				3 2 14	—
				3 2 21	—

## CHAPTER XI

### SOUTH NORTHERN RAILWAY

#### GENERAL MERCHANDISE (*continued*)—CARTAGE

THE conveyance of general merchandise by railway ordinarily implies that three successive journeys are required to transfer articles from the possession of the consignor to that of the consignee, the three movements being stated as follows.—

1. Conveyance from the consignor's premises to the forwarding station
2. Conveyance from the forwarding station to the receiving station
3. Conveyance from the receiving station to the consignee's premises.

A journey by railway thus comes between two short journeys by road which are usually accomplished by means of horse-power and carts or other vehicles. Stations are always intermediate places of arrival and departure, forming the terminals by road as well as by railway; the consignor's and the consignee's places of business respectively marking the true beginning and end of transit.

In the absence of other provision, a trader would have to convey his goods from his establishment to the forwarding station by means of his own horse and vehicle, and, on arrival at the receiving station, it would be incumbent on the consignee to remove the goods, in a similar manner, from the station to their ultimate destination. It would be expensive for each trader to keep a horse and vehicle expressly for this object, and, therefore, road carriers are commonly employed to perform the services constituting cartage. In towns and populous districts it is customary for railway companies to take upon themselves the execution of these duties, either directly or by means of appointed agents; their intermediate position as railway carriers peculiarly fitting them to become road carriers in undertaking to cart goods that are to be, or have been, conveyed by railway. It must be noted, however, that the performance of cartage thus undertaken applies only to certain descriptions of general merchandise, arbitrarily chosen, especially those kinds that are consigned in quantities varying from full loads to small packages, and excluding other kinds, such as are heavy and that are invariably consigned in full

loads. The transfer of a large part of general merchandise between stations and the numerous works, warehouses, and shops in towns and other places, is facilitated by this arrangement, notification of description, weight, and time when ready, having to be given by traders to the railway carriers or their agents, when merchandise is to be forwarded, incoming goods being carted and delivered at once upon arrival, or in a reasonable time thereafter, freeing the consignees from the need to take action. Great convenience is thus afforded to traders by the promptitude with which merchandise is moved, and the railway carriers derive advantage also, because they become enabled to discharge the railway wagons quickly, and in the particular order that is found most conducive to economy of time and labour in the management of traffic at stations. Were traders left to engage their own road carriers to convey goods to and from stations, it is probable that horses and vehicles would be provided too plentifully, and this circumstance would tend to impede the work of loading and unloading wagons.

When a railway company provides a carting staff at any station, it is usual to add the charges for cartage to the rates and charges for the transport of general merchandise by railway, so as to form single sums, per ton, for the combined services. Cartage comprehends the conveyance along a street, road, or highway, of a vehicle containing merchandise, and the performance of certain services before the journey begins and after it ends, corresponding, in a great measure, to the first and second terminal services rendered in relation to the transport of merchandise by railway. It is necessary to particularize the duties performed with the view of ascertaining how their separate cost may be calculated so as to be addable, in the form of charges, to the railway rates and charges.

Like other modes of transport, that of cartage demands a way, a vehicle, and a motive power. Roads, streets, and lanes form the way for the passage of vehicles furnished with wheels adapted thereto. In the streets of towns may frequently be seen carts, wagons, cabs, omnibuses, motor-cars, and other instruments of conveyance, proceeding in opposite or the same directions, passing each other, crossing each other's path, or following in line. In some parts of large cities, at points where streets converge, or where they intersect each other, at certain times of the day when the number of vehicles is wont to be very great, policemen regulate the traffic by temporarily stopping its flow in one street, while letting that in another continue its course; each street being dealt with alternately. Generally, however, the drivers of vehicles are allowed to thread their way past each other uninterruptedly. No direct charge is made by the authorities for the use of these thoroughfares, and they are open night and day. New roads and streets are formed at the expense of the owners or lessees of the adjacent land, and all, both old and new, are kept in repair out of taxes. Tolls were formerly collected at certain

places, toll-houses and gates being erected and entrusted to the charge of keepers ; but they have been abolished in many localities, and if they still exist in some parts of the country, it is probable that their extinction will follow in process of time. In these circumstances, the way required for the transit of loaded or empty vehicles between railway stations and the establishments of traders being provided free of cost or at the public expense, its use cannot form the subject of computation with regard to charges for cartage.

The use, by horses and vehicles, of the paved approaches to a station and its sidings forms a part of the terminal service of railage, the cost of which is included in the charges already calculated for the service. The use of roads, streets, and private land adjoining traders' shops, warehouses and works, in the course of transferring goods to and from vehicles, constitutes a terminal service in each case ; but inasmuch as the public authorities and traders permit the free use of such places for the purpose named, there is no need to calculate charges for the service.

Carts are often employed in the conveyance of merchandise, and, with regard to some kinds that are carried exclusively—for example, coal in a loose state—are suitable vehicles for the purpose. When, however, the goods to be carried are of many kinds, vehicles of four wheels are commonly used, and are better fitted than carts for the economic performance of the work to be done. Compared with a cart, a four-wheeled vehicle furnishes a larger and more serviceable platform to carry the load ; the extended base of four wheels bears the load more steadily and with greater safety in the act of travelling ; the animal drawing the vehicle is less burdened, and, when stoppages occur to receive or deliver goods, greater facilities are afforded in the operations of loading and unloading.

Like a railway wagon, a road wagon consists of two parts, namely, the lower structure and the upper structure ; the former designed to bear the load, and the latter to hold it in position during conveyance. The upper structures of road wagons used by railway companies and their agents are, in some respects, unlike those of railway wagons, which have already been described, although both road and railway wagons are employed to carry the same merchandise. Differences exist in the form of the upper structure of road wagons deemed to be the most suitable for general carrying purposes ; the form adopted by companies in some towns consisting of a floor with sides about two feet high and a tail-board, while companies in other towns prefer a floor with sides not more than two or three inches high, the whole being firmly joined together. A vehicle of the latter description is called a lorry. The road wagons used by railway companies or their agents in any town are, mostly, counterparts of each other, being built in the same fashion,

and differing only in weight and strength, so as to be adapted for the conveyance of light and heavy merchandise.

In proportion to the weight of each vehicle, a road wagon may carry a greater weight of load than a railway wagon. Road wagons are conveyed separately, not being in contact with each other in the course of transit as is the case with railway wagons. A certain amount of jolting takes place, attributable to the nature and condition of the roadways, the track of all thoroughfares being more or less uneven. The average speed of horses engaged in hauling loaded or empty wagons will, probably, lie between two and three miles an hour. Each vehicle, with the horse or horses drawing it, is in charge of an attendant, who, in the event of an accident happening during the journey—as the breaking of an axle or a wheel, or the slipping of the load—can stop immediately and prevent further mischief. It will be conceded, therefore, that a vehicle, intended to move slowly on a roadway under the close supervision of an attendant, may be loaded to the extreme limit of its bearing power, even to the verge of breaking down, with greater safety than a wagon that is to be attached to others to form a train and to travel on a railway at a high rate of speed—sometimes by night, in fog, and through tunnels—in charge of one or two guards, as the case may be, who are located in separate vehicles.

On account of its lightness, wood forms the principal material used in the construction of road wagons, and, by reason of the slow pace of draught horses and the fact that each vehicle is in charge of an attendant who can effect a stoppage at any moment, the strength afforded proves sufficient for the conveyance of heavy loads with safety. It is a matter of importance to road carriers that the vehicles employed should combine lightness with strength, and the greater degree in which these qualities are obtained the greater is the advantage likely to attend the prosecution of the business.

To hold the loads firmly in position on the vehicles during the journeys that have to be made, ropes and chains, as may be required, are used. When the weather is wet, tarpaulins are employed to cover goods that are damageable by rain, and sometimes take the place of ropes in binding the loads as well as protecting them. There are many days of fair weather during each year, and, save in exceptional cases, it is not then found necessary to use tarpaulins. The journeys to and from the stations are short and take up little time; many being made by each team in one day. A folded tarpaulin is carried on each vehicle, ready to be used if the weather become wet. The circumstances accompanying transit by road render the adoption of this course practicable. During a season of fine weather, therefore, almost all kinds of goods may be carted without being covered, the services of sheeting and unsheeting loads being then unnecessary. The conditions attending transit by

railway do not admit of this procedure being followed, all goods that are liable to suffer damage when exposed having to be covered during conveyance.

Tarpaulins, ropes, and chains, used to protect and bind loads during conveyance by road must be deemed to be parts of the vehicles, and, in reckoning the cost, it will be convenient to assume that each tarpaulin, binder, or other separate requisite is equivalent in value to a stated weight of solid structure, and to increase the weight of each road vehicle accordingly, in a manner similar to that which has been adopted in calculating, illustratively, the cost of tarpaulins, ropes, etc., used to cover and bind the loads of railway wagons.

The cartage of merchandise from stations to traders' places of business takes place, chiefly, in the first half of the day; the goods so delivered having been brought by trains during the previous night. The collection from traders of goods to be forwarded falls, mainly, in the last half of the day; loading and despatch by train being effected the same evening or night. Although these usages predominate, there are many instances to the contrary. For the most part, however, goods are carted from stations and delivered during the early part of the day, and, because return-loads are then only occasionally obtainable, the vehicles, after discharge, have to be hauled back, empty. It is the duty of the superintendent of each carting staff to arrange so that drivers taking out loads may load back whenever it is possible, and thus save the cost of returning with empty wagons. To enable him to do this with advantage, notification of the description, weight, and time when ready, of goods to be called for and carted to the station, should be given by traders as early in the day as possible. This knowledge, combined with the information possessed with regard to goods that are already at the station, waiting to be carted to the respective consignees, enables an experienced foreman to despatch the teams appointed to deliver and collect merchandise, in the most judicious order, so as to reduce the haulage of empty vehicles to the lowest point. In practice, it frequently happens that when an order has been given to collect goods lying at a trader's works or warehouse, an empty wagon has to be despatched from the station for the purpose. On other occasions, it is found convenient to send a wagon from a trader's place of business in the vicinity, after the delivery of a load. At other times, a wagon may be loaded with goods proceeding straight to the works or warehouse mentioned, and, after discharge, be reloaded with the goods to be forwarded. Notwithstanding the most favourable conditions that may exist with regard to the delivery and collection of merchandise in any town, a large portion of the cost of cartage is attributable to the haulage of empty vehicles.

The deterioration of a road wagon by wear and tear, in the process of cartage, is measured by its weight, loaded, and its weight, empty. It

is necessary to ascertain the ratio of the weight of empty road vehicles to that of loaded road vehicles, apart from the loads, conveyed the same distance, in order that the weight of empty vehicles may be correctly added to that of loaded vehicles in calculating the cost of cartage.

Horses commonly serve as the motive-power in cartage. Several horses may be employed to draw one vehicle when the load is heavy.

In some towns, at certain places where the roads are steep and there is much traffic, horses are specially provided to render assistance in the haulage of heavy loads; and, at all times, teamsters are allowed to lend each other their chain-horses, or leaders in circumstances of difficulty.

In some cities and densely populated towns, to prevent theft in the streets it is customary to employ boys to accompany drivers who are appointed to deliver and collect sundries, or small parcels of goods. One boy goes with each vehicle, and keeps watch on the load during the temporary absences of the driver.

The principal duty of a carter is the guidance and control of the horse or horses committed to his charge, including the oversight and care of the vehicle and its load. Whether in movement or stationary, and whether engaged in conveying a loaded or an empty wagon, the driver must always be on the alert and mindful of his trust. In addition, he has to assist in the operations of loading and unloading at the beginning and end of each journey. The part usually assigned to him, on these occasions, is the stowing of the goods in the process of loading, including, when cranes are used, the loosing of the hooks, chains, or slings, from the articles stowed; and, in the process of unloading, the handling of the goods, or, when cranes are used, the attachment of the hooks, chains, or slings, to the articles forming the load. It must be distinctly understood, however, that the duty of transferring goods between road vehicles and railway wagons or the platforms of warehouses at stations, forms a part of the terminal services of portage relating to transport by railway, and the cost is included in the charges already calculated for those services. It is incumbent on the trader to furnish labour and power at his own place of business in transferring goods to and from the wagon provided to carry them; the carter's duty being to stand on or near the vehicle to effect receipt or delivery. It is the province of a carter to bind, unbind, cover, and uncover, the load, as occasion requires, and, if need be, he is entitled to call on the trader at his own place of business to supply assistance in the operations, remembering that the cost of additional labour that might have to be employed for the purpose would be chargeable to the trader. When such duties are performed at stations, any required aid can be obtained from carters or other individuals in the same employ.

At stations, road wagons are frequently loaded or unloaded without



requiring to be moved during the operations. In some instances, however, especially if a load consist of more than one consignment of merchandise, the vehicles have to be moved from place to place before loading or discharge is accomplished. Also, at traders' places of business wagons have occasionally to be moved from one position to another before loading or unloading is completed, although, generally, the respective processes take place uninterruptedly.

During the time that a carter is engaged in helping to load and unload his vehicle, the horse or horses have to remain idle until the operations are completed. In many instances, this state of things is not remediable, but there are occasions when it is found profitable to employ individuals solely as loaders and unloaders in the stead of carters; the vehicles being first placed in position, and the horses then taken away to do other work. When loaded or discharged in this manner, the vehicles are subsequently removed to their destination by teams as they become disengaged from other duties. By this procedure, the horse-power available is exercised more advantageously, thus repaying the extra cost of labour.

The growing custom of the ruling authorities to let the streets of towns, and the highways connecting towns and populous districts, be used for the purpose of forming tramways and for the passage of tramcars, renders the duties of drivers more onerous. The practice not only adds to the amount of street traffic but tends to contract the space previously available for the passage of ordinary vehicles. The cars travel on defined tracks from which they cannot diverge, so that the duty of turning aside when meeting or overtaking other vehicles devolves on the individuals in charge of the latter.

The cost of cartage is influenced by many things which it will be instructive to mention. A town may be built on level ground and increase equably from every side, or, owing to various causes, it may grow more in one direction than in another. Or it may be built on a hill, or on land having elevations and depressions, or on one side or on both sides of a valley. The total area of land occupied by works, warehouses, shops, dwellings, and other erections forming a town or district, the configuration of the ground occupied, the width of the thoroughfares, the kind of paving and its general condition, the length of level roadways and of roadways that are inclines, with their gradients, separately affect the cost of cartage.

The location of the railway station, with regard to the town or district which it serves, is a matter of importance. Generally, a central situation is the most favourable, because the average distance that goods are carted is then, probably, the shortest attainable, but the route taken by the railway does not always lend itself to the acquirement of this position. Wherever the goods station may be placed,

it becomes necessary to define the boundaries or zone within which cartage is to be performed. Manufactories, warehouses, and shops, are to be found in all parts of a town, and, naturally, some will be near the station and others farther away from it. Since, in order to be addable to the united rates and charges, the charges computed for cartage are to apply to all distances between a station and traders' places of business contained within the limits that may be specified, it is necessary to ascertain the average distance that general merchandise is carted in each town or district.

The businesses of traders differ in magnitude, some being large and others small. They differ also in their nature, and in the weight of materials used relatively to the number of persons employed. Thus one trader will receive and forward large quantities of goods although requiring few hands, while another will buy and sell only a small weight of merchandise and employ a large number of work-people. To arrive at a satisfactory result it is needful that, with reference to traders who individually furnish any considerable part of the traffic dealt with at a station, the weight of goods and the distance carted during stated periods should be ascertained, in each instance. Calculations made from the particulars thus obtained will show the approximate average distance that merchandise is carted in connection with the station. Owing to various causes, but particularly to the fact that towns differ greatly in population and in the area of land occupied by buildings devoted to habitation or business, the average distances that goods are carted to and from stations, taking all towns and districts separately into account, vary rather widely. In some places, the distance carted may average half-a-mile, in others it may be a mile, and in very large towns it is likely to be considerably more than a mile. When the average distance that goods are carted has been computed for any town or district, there still remain, to enter into the reckoning of cost, the lengths of level and of inclined roadways, with the gradients, the kind of paving adopted by the local authority and its general condition, together with other influencing agents.

The distances that goods are carted in connection with any station may be described as short, although great differences exist, relatively, when the journeys are considered separately. Thus a journey of one mile is four times greater than that of a quarter of a mile, yet neither distance is absolutely long. In ascertaining the average distance that merchandise is carted, the object in view is to establish uniform charges for cartage, all distances being taken into account. This can be done only by charging the shorter distances a little more, and for longer distances a little less, than would be the case were the cost of cartage calculated according to the actual distance in each case. The greater the average distance that goods are carted the greater is the

disparity between the longer and the shorter distances of which it is the mean. Hence, in computing uniform charges for cartage, traders situated farthest from the station will derive a little advantage, and those nearest to it will suffer some disadvantage. The inequalities might be diminished, but not removed, by dividing the distance, marking the extreme boundary of collection and delivery, into equal parts, say into quarters-of-a-mile, and calculating rates, per ton, for consecutive distances. If, however, rates and terminal charges for cartage were computed in this manner, it would be impracticable to add them to rates and terminal charges for transport by railway so as to form single sums, per ton, for the combined services.

The particulars of the goods to be delivered to traders by each carter are entered, by clerks in the employ of the railway company, in the columns of a printed form, suitably prepared, showing, respectively, the names of the sending stations, the consignees' names, descriptions of the goods, the weights, and the amounts to pay, if any. It is the duty of the carter to obtain signatures from the consignees for the receipt of the goods, and to collect the amounts that may be due on delivery. On receiving goods from consignors, the carter's duty, after first noting their condition, is to sign an acknowledgment of receipt and to obtain a note furnishing, with regard to each consignment, the consignee's name and address, a description of the goods and the weight, with other necessary information. The sums received by a carter during the day have to be paid to the railway cashier at the station after the last journey. Thus, some of the carter's duties pertain to the services of clerkage which, when railway companies do not undertake the performance of cartage, are fulfilled by clerks at the stations, the cost being included in the charges calculated for the terminal services of clerkage relating to transport by railway.

There is similitude between conveyance by railway and by road. A staff of men, with a locomotive, is employed to convey wagons between two stations, attaching them at the first station and detaching them at the second station; the journey being then at an end. Or, if requisite, the train stops to detach and attach wagons at intermediate places on the way. After one journey is completed the return-journey begins, and other wagons are conveyed from station to station in a similar manner. A carter, with one or two horses, is employed to convey a vehicle, containing merchandise, from a station to a trader's place of business, where the vehicle is discharged; the merchandise being delivered to the consignee. Or, if needful, the vehicle is loaded with goods consigned to traders located in different parts of a town or district, and successive stoppages are necessary to effect delivery. After a journey is completed, the vehicle is, in most cases, conveyed back, empty, but, whenever practicable, it is reloaded at the last

place of stoppage, or at other works, warehouses, or shops in the vicinity—stopping as required—and conveyed to the station. The action of conveying a train of loaded or empty wagons between railway stations corresponds with that of conveying a loaded or empty vehicle to and from traders' places of business in a town or district in connection with a station. A train-load may be heavy or light, as also may be a loaded vehicle drawn by horses. Locomotives are employed to assist trains to ascend sections of railway that are inclines, and additional horses are requisite to haul loaded vehicles on sections of roadway that are steep.

In addition to the services constituting cartage, other duties need to be performed, and various requisites have to be provided, which it will be instructive to recount. Stables have to be built or rented in which horses may be lodged at night and during temporary cessations from labour. The possession of fields for the purpose of pasturing animals occasionally is often found to be necessary. The ownership or tenancy of structures and land involves the payment of rates and taxes. Corn, hay, straw, water, and other articles of consumption, have to be purchased. Fires and artificial light are needed which are paid for in the form of coal and gas. It is requisite to buy gears for animals and suitable furniture for stables. Horses have to be cleaned, fed, and watered daily, Sundays included, and a bedding of straw provided at night. When ill, the animals must cease work and be medically treated. Horse-shoes and shoeing are required periodically. Stablemen are employed to prepare the food, clean the harness, dry horse-cloths that have been exposed to the weather, and fulfil other duties. Time is spent in harnessing and unharnessing the horses, yoking them to vehicles and unyoking them, as occasion demands. Vehicles have to be oiled at times, and the upper parts kept clean. The provision of structures and land, the purchase of food and other requisites, and the discharge of the duties and obligations mentioned, are indispensable to the services constituting cartage although not actually forming a part of them, and may be described as supplemental duties.

In the course of cartage, stoppages are apt to occur, especially in large towns where the traffic is great in amount and progress difficult. Delays frequently take place at stations and at traders' places of business, prior to loading and unloading, and even during the operations, owing to a variety of causes. Conveyance by road is affected, adversely, by snow, frost, and fog, and rain adds to the weight of vehicles and their loads. In calculating the cost of cartage, delays and hindrances, occasioned by circumstances such as described, must be looked upon as analogous to supplemental duties, or as unavoidable causes of expense.

Generally, neither the strength nor the capacity of road vehicles

is so great as that of railway wagons. Moreover, while there may be one-horse and two-horse drivers, it is unadvisable to entrust more than two horses to the care of one man. Consequently, a load contained in a railway wagon may have a greater weight than a team of two horses can draw, or may occupy a greater space than an ordinary road vehicle affords. Bearing these things in mind, the manner in which general merchandise is consigned, to be conveyed by road and railway, alternately, and charged single sums, per ton, for the conjoined services, frequently creates conditions which make it impracticable for the measure of cartage performed in each case to accord with settled charges for the services constituting cartage, however calculated, as the following instances will show :—

1. General merchandise, furnishing a full load for a railway wagon, may be consigned by a trader in one town to a trader in another town, and, in some cases, one journey will serve to convey the merchandise by road in each town; in other cases, two or more journeys are requisite, owing to the weight or the bulk of the merchandise consigned being too great for the strength of a team of two horses or for the capacity of one vehicle.

2 General merchandise, furnishing a full load for a railway wagon, may be consigned by a trader in one town to two or more traders in another town, and the rate and charges, per ton, for transport by railway will be the same as if consigned to one trader. Assuming that one journey is sufficient to convey the merchandise by road in the first town, the different destinations in the second town might render two or more journeys requisite to effect delivery to the consignees.

3. Small parcels of general merchandise are consigned, daily, by traders in one town to traders in other towns, and, frequently, have to be collected by different carters and conveyed, singly or in small groups, to the station, where they are sorted, placed in wagons, and despatched to their several destinations (Collection of small consignments).

4 At each station wagons are received, daily, from other stations, and contain parcels for the same or for different traders. In discharging them, opportunity is afforded to sort the parcels so as to form full loads for one or more vehicles, as may be needful, after which they are conveyed and delivered to the respective consignees in orderly succession; the operations being performed with convenience and economy (Delivery of small consignments).

5. Also, as relevant to the subject, the land on which the buildings and streets of a town are constructed may be the side of a hill, and the position of the goods station may be high or low, according to the

course of the railway, rendering it more costly to cart goods to it than from it, or the reverse.

It is a convenience to railway companies and traders to employ single sums, per ton, combining rates and charges for transport by railway with charges for cartage, but the changed conditions occasioned by altered circumstances such as described, which are constantly occurring, preclude, in some cases, the agreement of fixed charges for cartage with the services performed. If charges for cartage had to be computed without reference to rates and charges for transport by railway, the amounts obtained might be expected to measure the value of the services performed with a reasonable approach to correctness in each instance, but they could not then be added to rates and charges to form single sums, per ton. Nevertheless, it can be shown how, in reference to general merchandise carried in open and in covered railway wagons, charges, per ton, for the services constituting cartage of such merchandise between a given station and the works, warehouses, shops, and other places of business situated in its neighbourhood, may be calculated as fairly as the conditions allow, and so as to be addable to the rates and charges, per ton, for transport by railway.

As already stated, the cost of clerical duties fulfilled by carters is included in the charges calculated for the terminal services of clerkage relating to transport by railway. There are, however, other duties, of a cognate character, to be discharged, wholly pertaining to cartage, for which it is necessary to compute charges. Animals, vehicles, equipments, provender, etc., have to be purchased, and the work often occasions interviews and the writing of letters. Owing to the continuous use of vehicles, harness, etc., repairs are constantly rendered needful. Horses have to be re-shod at intervals, loose shoes refastened, and the shoes roughened during a time of frost when the streets become slippery. Invoices are sent by tradesmen monthly or quarterly, and it is requisite to check the items before the debts are paid. It is the duty of road carriers to keep accounts of all business transactions. Time-keepers are employed, and wages are paid weekly or fortnightly, the names of carters and the amounts respectively due being entered in pay-lists. Balance-sheets have to be prepared periodically. The work performed by carters and their teams, represented by weights of loads, distances conveyed, and time occupied should be suitably recorded. The performance of these duties pertains to the service of clerkage.

In conveying merchandise by road, damage or loss may take place as in conveyance by railway, and from similar causes, rendering it necessary to calculate charges for risk. A certain amount of danger attends the passage of vehicles along a street or road, however slow may

be the pace. Omnibuses, cabs, light carts, tram-cars, and other descriptions of vehicles travel at a higher rate of speed than wagons loaded with merchandise, each vehicle being in charge of an individual who is not always a practised driver. Collisions often occur, sometimes unavoidably, but more frequently, owing to the insobriety, carelessness, or inexperience of drivers. Collisions are, probably, the principal cause of damage to goods and vehicles, and injuries to horses, although other occurrences contribute to the liabilities of carriers in undertaking the risk of conveying merchandise by road. Slippery roads during frosty weather render it difficult for horses to maintain their foot-hold in the act of drawing, and a fall may break a limb. Injuries to horses frequently unfit them for further service. Fire is often the cause of property being damaged or destroyed, occasioning loss.

To correctly calculate charges for cartage, it is needful that the factors employed should result from information that requires to be carefully gathered and recorded.

Let it be assumed that lorries are used to convey goods to and from a given station in connection with traders' places of business in the vicinity.

Let it be supposed that the average weight of open lorry, including accessories, as ropes, binders, etc., is 30 cwts., and that the average weight of covered lorry, including accessories, as tarpaulins, as well as ropes, binders, etc., is 34 cwts. (It is taken into account that on fine days covers are not required.)

With reference to general merchandise carried on open and on covered lorries, let it be assumed that the ratio of the weight of empty lorries to the weight of loaded lorries, apart from the loads, conveyed one mile, is the same as of three to four, or that the weight of each loaded lorry requires to be increased by three-fourths to include the conveyance of empty lorries. Consequently, it is necessary to add  $22\frac{1}{2}$  cwts. to 30 cwts., making the total weight of open lorry  $52\frac{1}{2}$  cwts., or  $2\frac{5}{8}$  tons, and to add  $25\frac{1}{2}$  cwts. to 34 cwts., making the total weight of covered lorry  $59\frac{1}{2}$  cwts., or, say 3 tons, in order to include the conveyance of empty lorries.

Let it be assumed that the average power employed per vehicle is equivalent to that of  $1\frac{2}{7}$  horses, or that for every six two-horse teams there is a one-horsed lorry.

Let it be supposed that the distance to which cartage is limited is one mile, and that the average distance that general merchandise is carted is three-quarters of a mile.

Let it be assumed that the average speed of draught horses employed is  $2\frac{1}{4}$  miles an hour, or three-quarters of a mile in 20 minutes.

Let it be supposed that the average weight of load carted per

journey is 30 cwts., and that the average time occupied in loading or unloading is 24 minutes.

Let charges for cartage be computed in reference to a limited number of the weights of loads distinguishing the grades in the illustrative Table prepared for general merchandise forming the first and second divisions of traffic. Let the greatest and least weights of loads, the cost of carting which, with the intermediate distinguishing weights of loads, is to form the subject of calculation, be  $2\frac{1}{2}$  tons and 1 ton for consignments pertaining to the first division, and  $3\frac{1}{2}$  tons and 1 ton for consignments pertaining to the second division of traffic. These weights of loads are employed to distinguish, respectively, grade 17 and the final grade for each division of traffic (Ex. 12). By this procedure, it is intended that the total charge, per ton, for cartage, appropriate to grade 17, shall apply to consignments pertaining to the first and second divisions of traffic, whose weights exceed  $2\frac{1}{2}$  tons and  $3\frac{1}{2}$  tons, respectively, and that the total charges, per ton, for cartage, appropriate to grades 28 and 29, shall apply to consignments pertaining to the first and second divisions of traffic, respectively, whose weights are less than 1 ton, and that the advantage derived from the cartage of heavier loads shall be held to compensate for the disadvantage resulting from the cartage of lighter loads.

The successive operations constituting cartage, namely, loading, binding, covering, conveying, uncovering, unbinding, and unloading, take place, ordinarily, without interruption, and must be treated as a continuous process. During the fulfilment of these duties, horse-power, a vehicle and its accessories, and an attendant who is, in turn, loader, driver, and unloader, are either partially or fully employed. Altering, for the sake of convenience, the order in which the operations are performed, and dividing them into constituent parts, the cost of which is to be separately calculated, the services performed are as follows:—

CONVEYANCE	NAMES OF SERVICES
1. Haulage, or the work accomplished by one or two horses under the guidance of one man.	Haulage Truckage.
2. Truckage, or the use of a road wagon and its accessories.	

#### FIRST AND SECOND TERMINAL SERVICES.

3. Stoppage to load, bind, and cover when required, fully employing one man and including the partial employment of one or two horses.	First combined terminal services of stoppage and portorage.
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- |  |  |
|--|--|
| 4 Truckage, or the use of a road wagon and its accessories during the time of stoppage   | } First terminal service of truckage.                          |
| 5. Stoppage to uncover, when required, unbind, and unload, fully employing one man and including the partial employment of one or two horses |  |
| 6 Truckage, or the use of a road wagon and its accessories during the time of stoppage.  | } Second combined terminal services of stoppage and portorage. |
|  |  |
|  | } Second terminal service of truckage.                         |
|  |  |

To these must be added —

7. Sundry clerical duties . . . . Clerkage.  
 8. Risk, or liability to suffer loss . . . Risk.

In computing the cost of haulage, stoppage, and portorage, forming the principal services relating to cartage, the expenses to be taken into account are as follows —

Wages and salaries of carters, stablemen, and superintendents  
 Consumption of corn, hay, water, fuel, etc., and the provision of straw for bedding  
 Repairs of harness, etc., and of furniture for stables.  
 Allowance for the medical treatment of horses when ill  
 Allowance for the replacement of horses when accidentally incapacitated or old and unfitted for work (Depreciation of animals).  
 Allowance for the renewal of harness and other necessary furniture when worn out (Depreciation of furniture for horses and stables)  
 Rent of stables, land, and fields.  
 Suppletive duties.  
 Changes of weather.  
 Taxes.

In addition, provision must be made for profit on the capital invested in horses, equipments, etc.

In calculating the cost of truckage, forming a part of the service of conveyance and a part of the first and second terminal services rendered during the time of stoppages in relation to cartage, the expenses to be taken into account are as follows :—

Consumption of stores as oil, grease, straw for packing purposes, etc.  
 Repairs of vehicles, tarpaulins, ropes, chains, etc  
 Allowance for the renewal of vehicles, tarpaulins, ropes, chains, etc, when worn out (Depreciation of road vehicles)

In addition provision must be made for profit on the capital invested in road vehicles and their accessories.

In calculating the cost of clerkage relating to cartage, the expenses to be taken into account are as follows :—

Wages and salaries of clerks and superintendents.

Consumption of stationery, cost of postage, etc.

Rent of offices supplied with necessary furniture.

Should there be no outlay of capital, nothing beyond adequate provision for the cost of clerkage is required.

Concerning risk, the loss in relation to merchandise, animals, and vehicles arising from accidents and other causes, sustained annually, which should be recorded, is the only guide in estimating the degree of responsibility attending the service of cartage.

Having regard to the cartage of general merchandise carried on open and on covered lorries :—

Let the sum chosen to compute charges for haulage, forming a part of the service of conveyance, be 3'000*d* per ton of load and lorry.

Let the sum chosen to compute charges for truckage, forming a part of the service of conveyance, be '090*d* per ton of load and lorry.

Let it be granted that a first and second terminal service of the same denomination are alike in extent and value when performed in reference to consignments of equal weight.

With respect to the combined terminal services of stoppage and portorage, it will be needful to repeat the procedure adopted in calculating charges for the terminal services of portorage relating to transport by railway (Ex. 7). This consists in letting the weights of vehicles bearing loads, as well as the weights of loads, enter into the computation, and affords an efficient means for regulating the progressive increase of charges, per ton of load, in any degree that may be considered just. Therefore, let the sums chosen to compute charges for each combination of the terminal services of stoppage and portorage be 2'100*d* per ton of load and 1'050*d* per ton of lorry bearing the load. The weights of lorries have been increased by three-fourths to include the weights of empty lorries conveyed, and need to be decreased. Instead of altering the weights, it will be more convenient and equally effective to diminish, in a corresponding degree, the sum to be employed as a factor with the weights. Therefore, in place of 1'050*d*., let '600*d* per ton, or four-sevenths of the sum, be employed as a factor with the unaltered weights of lorries in computing charges for each combination of the terminal services of stoppage and portorage.

The terminal services of truckage refer only to the weights of lorries

bearing loads, and the charges must be computed accordingly. It shall be assumed that, during the periods of loading and unloading, vehicles, being stationary, deteriorate less than when in motion, and, consequently, that a reduced sum may be employed to calculate charges for the terminal services of truckage.

Let the sum chosen to compute charges for each terminal service of truckage be  $\cdot 070d.$  per ton of load and of lorry bearing the load. The weights of lorries have been increased by three-fourths to include the weights of empty lorries conveyed, and need to be decreased. Instead of altering the weights, it will be more convenient to lessen, in a corresponding degree, the sum to be employed as a factor with the weights. Therefore, instead of  $\cdot 070d.$ , let  $\cdot 040d.$  per ton, or four-sevenths of the sum, be employed as a factor with the unaltered weights of lorries in computing charges for each terminal service of truckage.

Let the sum chosen to compute charges for the service of clerkage be  $180d.$  per ton of load and lorry, including the weight of empty lorries conveyed.

Let the sum chosen to compute charges for risk be  $\cdot 120d.$  per ton of load and lorry, including the weight of empty lorries conveyed.

Calculated by means of the sums chosen, charges for services, liabilities, and obligations, relating to the cartage of general merchandise, forming the first and second divisions of traffic between a given station and traders' places of business in the vicinity, are shown, separately and unitedly, in Example 16, following. The grades made use of are identical with those in Example 12, and the same weights of loads are employed to distinguish them. From grade 17 to the final grade, inclusive, for each division of traffic, the distinguishing weights of loads are joined with the average weights of lorries; the latter increased by three-fourths to include the conveyance of empties. Unit-weights of loads joined with fractional weights of lorries, whose ratios are equal, or nearly equal, to the ratios of the weights of loads joined with the weights of lorries respectively distinguishing the grades referred to, are entered in the columns to form factors in the computation of charges. To guard against misapprehension, it may be remarked that the weights of lorries proportionate to unit-weights of loads differ from the weights of (railway) wagons proportionate to unit-weights of loads.

For reasons already stated, the weight of lorry proportionate to unit-weight of load, calculated for grade 17, is assumed to be appropriate to preceding grades, embracing both divisions of traffic.

If the total charges forming a scale of charges for cartage, in the preceding Example, were added to the scales of rates and charges for transport by railway, in Example 12, scales of rates and charges, per ton of load, including charges for cartage in connection with one terminal station, would be obtained. A carting staff is not provided

at every station, and, consequently, general merchandise conveyed from station to station may be carted by a railway company or its agents in connection with both stations, with one station only, or with neither station, according to circumstances.

For the sake of clearness, let places that have carting staffs be called towns and those that are not so provided be called villages. If the same scale of charges for cartage were deemed appropriate for all towns, two Tables of Rates and Charges, including charges for cartage, would be required, as follows .—

Town linked with town would require two scales of charges for cartage	} to be added to the scales of rates and charges for transport by railway.
Town linked with village would require one scale of charges for cartage	

It is likely, however, that different scales of charges for cartage will be requisite, if only because of the diverse conditions created by large and small towns. If two different scales of charges for cartage were established, the higher scale to apply to large towns and the lower scale to apply to small towns, five different Tables of Rates and Charges, including charges for cartage, would be necessary, as follows —

Large town linked with large town would require two identical scales of charges for cartage	} to be added to the scales of rates and charges for transport by railway.
Small town linked with small town would require two identical scales of charges for cartage	
Large town linked with small town would require two different scales of charges for cartage	
Large town linked with village would require the higher scale of charges for cartage	
Small town linked with village would require the lower scale of charges for cartage	

Probably, more than two scales of charges for cartage will be needed, having in mind the differences in population, area of land occupied, and other considerations, with regard to the many cities and towns in the country; and, naturally, each additional scale of charges will necessitate an increase of the number of Tables of Rates and Charges for the conjoined services.

When charges for cartage are added to rates and charges for transport by railway, the fact may be intimated by joining the small letter *c*, accompanied by the figures 1 or 2, to the symbols *A*1 and *B*1. If thus used, the symbols, *A*1*c*1 and *B*1*c*1, would denote that the sums, per ton of load, in a Table, included charges for cartage in connection with one station, as well as rates and charges for the transport of general

merchandise in open and in covered wagons by one railway company, and the symbols *A1c2* and *B1c2* would mean that the sums, per ton of load, in a Table, included charges for cartage in connection with two stations, in addition to rates and charges for transport by one railway company.

The number of Tables of Rates and Charges, including charges for cartage, required in all, will depend on the number of scales of charges for cartage that it may be found necessary to establish. The scales of charges for cartage should be progressively numbered, and the No. of the scale appropriate to each station at which a carting staff is provided, should be printed in immediate connection with the name of the station.

Presuming that the mode of calculating charges for cartage so as to be unitable to rates and charges for transport by railway has been sufficiently set forth, it is considered unnecessary to furnish a Table of Rates and Charges, including charges for cartage, in further illustration of the subject.

Computed by means of a sum, per ton, for cartage, the amounts yielded for small consignments of merchandise will not prove a sufficient recompense for the services rendered. The stoppage of a loaded or empty vehicle, drawn by one or two horses in charge of an attendant, at a station or a trader's place of business, to deliver or receive a parcel, however small, occupies an appreciable space of time and occasions expense. It becomes necessary, therefore, to establish minimum charges for the first and second combined terminal services of stoppage and portorage, respectively performed in relation to the cartage of small consignments of general merchandise comprised in the first and second divisions of traffic.

If, in all cases, small consignments were delivered, separately, to consignees, and collected, separately, from consignors, the cost would be very considerable; but, although in some instances separate delivery and collection take place, on many occasions parcels from different consignors are delivered at one time to a consignee, and are collected at one time from a consignor to be conveyed to different consignees. The latter occurrences compensate, to some extent, for the former, and supply a reason for modifying the respective amounts that it is requisite to establish as minimum charges.

Using the scale of charges for cartage, furnished in Example 16, for the purpose of illustration, let the sum chosen as the minimum charge for each combination of the terminal services of stoppage and portorage, performed in reference to single consignments of general merchandise carried on open lorries, be a half-penny, or for the first and second combined terminal services of stoppage and portorage, one penny. At 7'44*d* per ton, which forms the total charge for the first and second combined terminal services of stoppage and portorage, calculated in

reference to grade 28 in Example 16, or the final grade for general merchandise carried on open lorries, 2 cwts. 2 qrs. 21 lbs. yields one penny. Therefore, having regard to these services, consignments of general merchandise that are carried on open lorries and weigh less than 2 cwts 2 qrs 21 lbs. become small consignments for which the sum of one penny is to be charged in each case.

Let the sum chosen as the minimum charge for each combination of the terminal services of stoppage and portorage, performed in regard to single consignments of general merchandise carried on covered lorries, be three farthings, or for the first and second combined terminal services of stoppage and portorage, three halfpence. At 780d. per ton, which forms the total charge for the first and second combined terminal services of stoppage and portorage, calculated in reference to grade 29 in Example 16, or the final grade for general merchandise carried on covered lorries, 3 cwts. 3 qrs 11 lbs., yields three halfpence. Therefore, having regard to these services, consignments of general merchandise that are carried on covered lorries and weigh less than 3 cwt. 3 qrs 11 lbs. become small consignments for which the sum of three halfpence is to be charged in each case.

Let it be supposed that the total charges for cartage, in Example 16, have been added to the rates and charges, in Example 12, to form a fresh Table of Rates and Charges, per ton, including charges for cartage in connection with one station. In order to make due provision for the expense of collecting and delivering small consignments of general merchandise carried on open and on covered lorries, respectively, it would then be necessary to enter the minimum charges for the first and second combined terminal services of stoppage and portorage, relating to cartage, in line with the minimum charges for the first and second terminal services of clerkage and portorage, relating to transport by railway; and, by means of the sums, per ton, forming charges for the first and second combined terminal services of stoppage and portorage, appropriate to grades 28 and 29 (Ex. 16), respectively, to compute deficiencies, or the amounts wanted to make up minimum charges for cartage, with reference to the divisional weights, in the manner shown in Examples 13 and 14. The divisional weights would have to be slightly extended in order to embrace 3 cwts. 3 qrs. 11 lbs., the assumed limit of weight for small consignments carried on covered lorries. It would also be needful to show, in connection with each division of traffic, the sums, stated in pence and farthings, denoting the total deficiencies relating to the first and second combined terminal services of stoppage and portorage (cartage) and the first and second terminal services of clerkage and portorage (transport by railway), inclusively, to be added to amounts calculated by means of rates and charges, and charges for cartage in connection with one station, combined, when applying to

small consignments that pertain to the divisional weights, in the manner shown in Example 15.

By doubling the total charges for cartage in Example 16, and adding them to the rates and charges in Example 12, an additional Table of rates and charges, including charges for cartage in connection with two stations, would be formed. In that event, the minimum charges for the first and second combined terminal services of stoppage and portorage, relating to cartage, would have to be doubled also, and deficiencies would have to be computed by means of doubled sums, per ton, forming charges for the first and second combined terminal services of stoppage and portorage, appropriate to grades 28 and 29, respectively. This procedure would not affect the two limits of weight marking small consignments of general merchandise carried on open and on covered lorries, respectively, because the scale of charges for cartage would be the same for each of the two stations; but the sums, denoting the total deficiencies, to be added to amounts calculated by means of the rates and charges, and charges for cartage in connection with two stations, combined, would be increased. Consequently, renewed calculations, similar to those in Examples 13, 14, and 15, would be necessary to fit the altered circumstances.

The establishment of different scales of charges for cartage, which seems unavoidable, and their respective union with rates and charges to agree with the circumstances of each pair of linked stations, will increase the number of Tables of Rates and Charges, and charges for cartage, combined. Joined with each Table, it will be needful to show the sums, denoting the total deficiencies calculated in reference to the divisional weights, that require to be added to amounts computed by means of the rates and charges, and charges for cartage, combined, when applying to small consignments of general merchandise carried on open and on covered lorries, to make up the respective minimum charges.

## CHAPTER XII

### SOUTH NORTHERN RAILWAY COMPANY

#### ARTICLES OF EXTRAORDINARY WEIGHT OR DIMENSIONS CARRIED IN PECULIARLY-CONSTRUCTED WAGONS

SINGLE articles of merchandise that are too heavy or too large to be carried in wagons of ordinary form or size constitute the third division of traffic. To receive and carry them with safety, it is requisite to build vehicles of peculiar shape and of considerable length, with bearing parts of great power. Being unsuited to carry other kinds of merchandise, it is customary to restrict their use to the purpose for which they are designed. Taking the whole of the country into consideration, only a few firms, comparatively speaking, manufacture or produce merchandise that requires peculiarly-constructed wagons for its transportation. Boilers, fly and spur wheels, colliery pulleys, and huge castings may be mentioned as some of the articles comprised in this division of traffic. Vehicles of peculiar construction, built for a special purpose and limited thereto, cannot, except on rare occasions, be reloaded at the stations where they have been discharged. Generally, after being unloaded, they are conveyed to one or other of the few stations where suitable loads can be looked for. Consequently, the weight of empty wagons of this description may be expected to be equal to, if not greater than, the weight of loaded wagons, apart from the loads, conveyed one mile.

It is possible that peculiarly built vehicles may not be so frequently employed as ordinary wagons, by reason of having to wait, at times, for suitable loads. Deterioration from atmospheric causes takes place whether a wagon stands idle or is employed, and it may be found advisable to charge more, per ton, for the use of vehicles of the character described than for the use of ordinary wagons. This is a matter that will require to be carefully considered. Meantime, to serve the purpose of illustration, the sums already made use of as factors to calculate charges for the terminal and interterminal services of truckage, rendered in relation to general merchandise, will be employed to compute charges for the same services rendered in relation to articles of merchandise of uncommon weight or dimensions.

Some senders and some receivers of this description of merchandise



have private sidings in proximity to their works, which are connected by junctions with the railway, whilst other traders are not so circumstanced. Hence, articles of extraordinary size or weight may be conveyed from stations to stations, from private sidings to private sidings, from stations to private sidings, or from private sidings to stations; the respective locations of the consignors and consignees jointly determining the matter in the case of each consignment.

Screw-jacks and other portable machinery are often used as instruments to raise and lower articles of great weight in connection with the loading and unloading of wagons at stations; the cranes commonly provided at these places not being strong enough for the purpose. The men employed by firms producing large or heavy articles are, from experience, well qualified to handle them, either by placing them in position on wagons preparatory to conveyance by railway, or by transferring them from railway wagons to vehicles prior to conveyance by road. For these reasons, railway companies are seldom called upon to perform the services of portage in relation to articles of extraordinary weight or dimensions; the consignors or consignees usually furnishing the labour and machinery required. It will, therefore, be expedient to omit the calculation of charges for the first and second terminal services of portage with reference to merchandise comprised in the third division of traffic.

Let it be assumed that articles of extraordinary weight or dimensions, constituting the third division of traffic, are conveyed from stations to stations in vehicles provided by the railway company, specially constructed for the purpose; and let the symbols,  $C_1$ , be used to denote that such articles are conveyed by one railway company only, under the conditions stated.

Let it be assumed that the greatest weight of load which a peculiarly-constructed wagon may carry is twice the weight of the wagon itself.

Let it be supposed that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed 1 mile, is the same as of 1 to 1, or that the weight of each loaded wagon requires to be doubled in order to include the conveyance of empties.

On these grounds, when a peculiarly-constructed wagon carries its greatest weight of load, and the weight of the wagon has been doubled to include the conveyance of empties, the weight of wagon proportionate to unit-weight of load will be 1 ton, corresponding to grade 9.

Let it be assumed that wagons of two sizes are built specially to carry articles of unusual weight or dimensions; one size of wagon weighing 16 tons, including its accessories, and registered to carry 32 tons; the other weighing 12 tons, including its accessories, and registered to carry 24 tons.

Inasmuch as articles in the third division of traffic vary, considerably, in weight, while still retaining their distinctive character with regard to size, it will be necessary to employ a large number of grades to provide for contingencies. There will, however, be no occasion to specify the grades suitable for full loads furnished by articles of any description in this division of traffic. The weight of each article consigned, joined with the weight of wagon in which it is carried, doubled to include the conveyance of empties, will approximate to one of the weights of loads employed to distinguish the grades, and the rates and charges, calculated for the grade indicated, will apply—with the proviso that a larger amount must not be charged for a less load than for a greater.

Let twenty-one grades, Nos 9 to 29, be assigned to the third division of traffic, and let the weights of loads chosen to distinguish the grades and to be joined respectively with the weights of the two sizes of wagons, doubled to include the conveyance of empties, be as follows.—

*Merchandise consisting of articles of extraordinary weight or dimensions forming the third division of traffic*

Nos of grades	Distinguishing weights of loads to be joined, individually, with 32 tons, or twice the weight of the larger wagon, 16 tons			Successive decreases of weight	Nos of grades	Distinguishing weights of loads to be joined, individually, with 24 tons, or twice the weight of the smaller wagon, 12 tons			Successive decreases of weight
	Tons	Tons cwt	qrs			Tons	Tons cwt	qrs	
9	32	or 32	0 0	—	9	24	or 24	0 0	—
10	29 $\frac{1}{10}$	,, 29	2 0	2 18 0	10	21 $\frac{1}{2}$	,, 21	16 0	2 4 0
11	26 $\frac{1}{20}$	,, 26	13 0	2 9 0	11	20	,, 20	0 0	1 16 0
12	24	,, 24	0 0	2 13 0	12	18	,, 18	0 0	2 0 0
13	21 $\frac{1}{3}$	,, 21	16 0	2 4 0	13	16 $\frac{7}{10}$	,, 16	7 0	1 13 0
14	19 $\frac{1}{3}$	,, 19	12 0	2 4 0	14	14 $\frac{1}{10}$	,, 14	14 0	1 13 0
15	17 $\frac{1}{3}$	,, 17	16 0	1 16 0	15	13 $\frac{1}{2}$	,, 13	7 0	1 7 0
16	16	,, 16	0 0	1 16 0	16	12	,, 12	0 0	1 7 0
17	14 $\frac{1}{10}$	,, 14	11 0	1 9 0	17	10 $\frac{9}{10}$	,, 10	18 0	1 2 0
18	13 $\frac{7}{10}$	,, 13	7 0	1 4 0	18	10	,, 10	0 0	0 18 0
19	12 $\frac{1}{10}$	,, 12	3 0	1 4 0	19	9 $\frac{1}{10}$	,, 9	2 0	0 18 0
20	11	,, 11	0 0	1 3 0	20	8 $\frac{1}{2}$	,, 8	5 0	0 17 0
21	10	,, 10	0 0	1 0 0	21	7 $\frac{1}{2}$	,, 7	10 0	0 15 0
22	9 $\frac{1}{10}$	,, 9	1 0	0 19 0	22	6 $\frac{1}{2}$	,, 6	16 0	0 14 0
23	8 $\frac{1}{2}$	,, 8	4 0	0 17 0	23	6 $\frac{3}{10}$	,, 6	3 0	0 13 0
24	7 $\frac{9}{10}$	,, 7	9 0	0 15 0	24	5 $\frac{1}{10}$	,, 5	11 2	0 11 2
25	6 $\frac{1}{2}$	,, 6	15 0	0 14 0	25	5 $\frac{1}{10}$	,, 5	1 0	0 10 2
26	6 $\frac{1}{10}$	,, 6	3 0	0 12 0	26	4 $\frac{1}{2}$	,, 4	12 0	0 9 0
27	5 $\frac{1}{2}$	,, 5	12 0	0 11 0	27	4 $\frac{1}{10}$	,, 4	4 0	0 8 0
28	5 $\frac{1}{10}$	,, 5	2 0	0 10 0	28	3 $\frac{1}{10}$	,, 3	16 2	0 7 2
29	4 $\frac{1}{10}$	,, 4	13 0	0 9 0	29	3 $\frac{1}{2}$	,, 3	10 0	0 6 2

Let it be made a condition that any consignment of merchandise weighing less than the weight of load distinguishing the final grade appropriate to the weight of wagon in which the consignment is carried, shall be charged not less than as for such distinguishing weight. Consequently, the minimum weights of loads for consignments pertaining to the third division of traffic, carried in the two sizes of wagons adopted

for illustration, will be  $4\frac{1}{10}$  tons and  $3\frac{1}{2}$  tons, respectively employed to distinguish grade 29.

In the process of illustrating the method of calculating rates and charges for merchandise in any division of traffic, it is undesirable to repeat Examples if the factors to be made use of are identical. Instead of doing so, it will suffice to refer to the Nos. of the Examples already furnished

With regard to merchandise included in the third division of traffic, conveyed under the conditions stated, the rates, so far as concerns grades 9 to 29, and the consecutive distances to which they are to apply, will be identical with those employed in reference to general merchandise. The charges for the terminal services of stoppage and the junctional services of stoppage, railage, haulage, and truckage will be identical also, because these services, viewed individually, are assumed to be rendered in relation to loaded wagons and empty wagons during equal periods of time; and inasmuch as the fractional weights of wagons, respectively joined with the unit-weights of loads, include a proportionate part of the weight of empty wagons, the factors to be employed to calculate charges for the terminal and junctional services mentioned, performed in reference to articles of extraordinary size or weight, will correspond with the factors employed to compute charges for the same services rendered in relation to general merchandise.

Charges for the services of portorage will not be computed for reasons already stated

The movements of vehicles specially designed to carry articles of great weight or magnitude should be continuously recorded in order that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed 1 mile, may be correctly ascertained from period to period. By continuing to apportion the cost in the same manner as before, the charges for the services of clerkage computed for general merchandise will appropriately apply to merchandise in the third division of traffic

The charges for risk and extraneous services, calculated for general merchandise, will fitly apply to merchandise in the third division of traffic.

Accordingly, scales of rates, embracing grades 9 to 29 inclusive, with the consecutive distances to which they apply, and charges for services, liabilities, and obligations, mentioned below, calculated for general merchandise and forming a part of the illustrative Examples already furnished, will be appropriate for merchandise in the third division of traffic as follows —

Scales of rates, including taxes, for grades 9 to 29,  
 and the consecutive distances to which they } as in Example 11.  
 are to apply,

Charges for the first and second terminal services	} as in Example 2.
of stoppage, including taxes,	
Charges for the junctional services of stoppage,	} as in Example 6.
railage, haulage and truckage, including taxes,	
Charges for the first and second terminal services	} as in Example 8
of clerkage,	
Charges for risk	as in Example 9
Charges for extraneous services	as in Example 9.

The services of railage, haulage and truckage, relating to loaded and empty wagons, respectively, are fulfilled at first and second terminal stations during unequal periods of time. Therefore, in arriving at the charges for each service it is necessary that the weights of loaded wagons, apart from the loads, and the weights of empty wagons, should separately form the subject of computation. It has been assumed, with regard to general merchandise, that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed 1 mile, is the same as of 1 to 4, and with regard to articles of extraordinary weight or magnitude, as of 1 to 1, and the weights of wagons have been increased accordingly. Instead of decreasing the weights of wagons with the object of calculating appropriate charges for the terminal services named, it is preferable to let them remain unaltered, and to lessen, in a corresponding degree, the sums to be employed as factors with them in the computation of charges, per ton. The sums to be employed as factors with the unaltered weights of wagons in calculating charges, per ton, for the first and second terminal services of railage, haulage, and truckage, will differ for each change of ratio, and, consequently, will render necessary the provision of fresh Examples to show the altered charges.

Let it be supposed that when peculiarly-constructed wagons are discharged at stations, and have to be sent, empty, to other stations to be loaded, one day is required to move them from the sidings in which they stand, place them in position for departure, and despatch them. Also, when they arrive at the stations where they have to be loaded, let it be supposed that half a day is required to place them in position for loading, and half a day to load, marshal with others, and despatch them. Although the services of railage, haulage, and truckage, fulfilled with regard to empty wagons at second terminal stations, properly pertain to first terminal services, it must be remembered that, in some instances, the respective terminal places will be a station and a private siding, the latter being provided by a trader. Therefore, in order that each terminal place, whether station or private siding, may be duly credited with the services rendered thereat, it is needful that the charges calculated for the services referred to should be added to the charges calculated for the second terminal services of the same denomination

Let it be supposed that the maximum period of time allowed for peculiarly constructed wagons to remain under load at second terminal stations, for the convenience of traders, is three days, and that the average period of time during which they remain before they are discharged is two days. By this assumption the average period of time during which the second terminal services of railage, haulage, and truckage are performed, in relation to loaded wagons, is two days.

Let the sums chosen to compute charges for that portion of the first terminal service of railage which is rendered at first terminal stations in relation to articles of extraordinary size or weight, during a period of half a day, be '150*d.* per ton of load, and, during a period of one day, '300*d.* per ton of wagon, including taxes and profit. The weights of wagons have been doubled to include the conveyance of empties, and should be decreased. Instead of altering the weights it will be more convenient to decrease, in a corresponding degree, the sum to be employed as a factor with the weights. Therefore, let '150*d.* per ton, or one-half of '300*d.*, be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of railage which is rendered at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of railage, rendered in relation to articles of extraordinary size or weight during a period of two days, be '600*d.* per ton of load and '600*d.* per ton of wagon, including taxes and profit. To correct the weights added for the conveyance of empties, let '300*d.* per ton, or one-half of 600*d.*, be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of railage.

Let the sum chosen to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations in relation to empty wagons of peculiar construction, during a period of one day, be '300*d.* per ton, including taxes and profit. Since the weights of wagons have been doubled to include the conveyance of empties, the sum named is applicable to one-half of the increased weights of wagons. Instead of altering the weights, let '150*d.* per ton, or one-half of 300*d.*, be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of railage, rendered in regard to articles of extraordinary size or weight, are shown in the next Example (Ex. 17).

Let the sums chosen to compute charges for that portion of the first terminal service of haulage which is performed at first terminal stations in relation to articles of extraordinary size or weight, during a period of half a day, be '300*d.* per ton of load, and, during a period of one day, '600*d.* per ton of wagon, including profit. To correct the weights added

## EXAMPLE 17

SOUTH NORTHERN

*Articles of extraordinary weight or dimensions carried in peculiarly-*

NOS OF GRADES	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>Ci.</b> Distinguishing weights of loads (1)	32	29 $\frac{1}{2}$	26 $\frac{1}{2}$	24	21 $\frac{1}{2}$	19 $\frac{3}{4}$	17 $\frac{1}{2}$	16
Weights of wagons (16 tons + 16 tons for empties)	32	32	32	32	32	32	32	32
<b>Ci.</b> Distinguishing weights of loads (2)	24	21 $\frac{1}{2}$	20	18	16 $\frac{7}{8}$	14 $\frac{7}{8}$	13 $\frac{7}{8}$	12
Weights of wagons (12 tons + 12 tons for empties)	24	24	24	24	24	24	24	24
Unit-weights of loads	1	1	1	1	1	1	1	1
Proportionate weights of wagons	1	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2
Totals	2	2 $\frac{3}{8}$	2 $\frac{5}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3
	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>
Charges for a portion of the 1st terminal service of railage, computed at 150 <i>d</i> per ton of load	150	150	150	150	150	150	150	150
And at 150 <i>d</i> per ton of wagon	150	165	180	200	220	245	270	300
Total charges for a portion of the 1st terminal service of railage	300	315	330	350	370	395	420	450
Charges for the 2nd terminal service of railage, computed at 600 <i>d</i> per ton of load	600	600	600	600	600	600	600	600
And at 300 <i>d</i> per ton of wagon	300	330	360	400	440	490	540	600
Charges for that portion of the 1st terminal service of railage which is rendered at 2nd terminal stations, computed at 150 <i>d</i> per ton of wagon	150	165	180	200	220	245	270	300
Total charges for the 2nd and a portion of the 1st terminal service of railage	1 050	1 095	1 140	1 200	1 260	1 335	1 410	1 500
Total charges for the 1st and 2nd terminal services of railage, including taxes	1 350	1 410	1 470	1 550	1 630	1 730	1 830	1 950

## RAILWAY COMPANY

*constructed wagons—Charges for first and second terminal services of railage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
14 $\frac{1}{2}$	13 $\frac{7}{8}$	12 $\frac{1}{2}$	11	10	9 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{3}{4}$	6 $\frac{3}{4}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$
32	32	32	32	32	32	32	32	32	32	32	32	32
10 $\frac{1}{2}$	10	9 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{1}{2}$
24	24	24	24	24	24	24	24	24	24	24	24	24
1	1	1	1	1	1	1	1	1	1	1	1	1
2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{1}{4}$	4 $\frac{3}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{2}$	6 $\frac{1}{4}$	6 $\frac{3}{4}$
3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{4}$	5 $\frac{3}{4}$	6 $\frac{1}{4}$	6 $\frac{1}{2}$	7 $\frac{1}{4}$	7 $\frac{3}{4}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
150 330	150 360	150 395	150 435	150 480	150 530	150 585	150 645	150 710	150 780	150 855	150 940	150 1 030
480	510	545	585	630	680	735	795	860	930	1 005	1 090	1 180
600 660	600 720	600 790	600 870	600 960	600 1 060	600 1 170	600 1 290	600 1 420	600 1 560	600 1 710	600 1 880	600 2 060
330	360	395	435	480	530	585	645	710	780	855	940	1 030
1 590	1 680	1 785	1 905	2 040	2 190	2 355	2 535	2 730	2 940	3 165	3 420	3 690
2 070	2 190	2 330	2 490	2 670	2 870	3 090	3 330	3 590	3 870	4 170	4 510	4 870

for the conveyance of empties, let  $\cdot 300d$ . per ton, or one-half of  $600d$ ., be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of haulage which is performed at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of haulage, performed in relation to articles of extraordinary size or weight during a period of two days, be  $1\ 200d$ . per ton of load and  $1\ 200d$ . per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $600d$ . per ton, or one-half of  $1\ 200d$ ., be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of haulage.

Let the sum chosen to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations in relation to empty wagons of peculiar construction, during a period of one day, be  $600d$ . per ton, including profit. Since the weights of wagons have been doubled to include the conveyance of empties, the sum named is applicable to one-half of the increased weights of wagons. Instead of altering the weights, let  $\cdot 300d$ . per ton, or one-half of  $\cdot 600d$ ., be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of haulage, performed in regard to articles of extraordinary weight or dimensions, are shown in the next Example (Ex 18, pp 196-197)

Let the sums chosen to compute charges for that portion of the first terminal service of truckage which is rendered at first terminal stations in relation to articles of extraordinary size or weight, during a period of half a day, be  $\cdot 300d$ . per ton of load, and, during a period of one day,  $\cdot 600d$ . per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $\cdot 300d$ . per ton, or one-half of  $600d$ ., be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of truckage which is rendered at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of truckage, rendered in relation to articles of extraordinary size or weight during a period of two days; be  $1\ 200d$ . per ton of load and  $1\ 200d$ . per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $600d$ . per ton, or one-half of  $1\ 200d$ ., be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of truckage.

Let the sum chosen to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations in relation to empty wagons of peculiar construction, during a period of



one day, be 600*d* per ton, including profit. Since the weights of wagons have been doubled to include the conveyance of empties, the sum named is applicable to one-half of the increased weights of wagons. Instead of altering the weights, let 300*d* per ton, or one-half of 600*d* be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of truckage, rendered in regard to articles of extraordinary weight or dimensions, are shown in Example 19 (pp. 198-199).

A complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to articles of extraordinary weight or dimensions, is given in Example 20 (pp. 200-201). Reference to the No. of Example whence the charges have been taken is entered opposite the name of each kind of service, liability, and obligation.

Example 21 (pp. 202-207) constitutes a complete Table (Table II) of Rates and Charges, per ton of load, for merchandise comprised in the third division of traffic, conveyed from stations to stations in wagons provided by the railway company. It is prepared by adding the rates for consecutive distances calculated for grades 9 to 29, inclusive, contained in Example 11, to the total charges contained in Example 20, to form scales of united rates and charges, stated in shillings and pence, together with the consecutive distances, embracing 1 to 200 miles, to which they apply. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence. The consecutive distances correspond with those adopted for general merchandise; the rate of progression being increased, after 15 miles, from 1 to 2 miles, and after 65 miles, from 2 to 3 miles.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be computed and entered in the manner shown in the Example.

The amounts due for the transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the

## EXAMPLE 18

SOUTH NORTHERN

*Articles of extraordinary weight or dimensions carried in peculiarly-*

NOS OF GRADES	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>Cr.</b> Distinguishing weights of loads Weights of wagons (16 tons + 16 tons for empties)	32	$29\frac{1}{10}$	$26\frac{1}{10}$	24	$21\frac{1}{5}$	$19\frac{1}{5}$	$17\frac{1}{5}$	16
	32	32	32	32	32	32	32	32
<b>Cr.</b> Distinguishing weights of loads Weights of wagons (12 tons + 12 tons for empties)	24	$21\frac{1}{5}$	20	18	$16\frac{7}{10}$	$14\frac{7}{10}$	$13\frac{7}{10}$	12
	24	24	24	24	24	24	24	24
Unit-weights of loads Proportionate weights of wagons	1	1	1	1	1	1	1	1
	1	$1\frac{2}{10}$	$1\frac{6}{10}$	$1\frac{10}{10}$	$1\frac{14}{10}$	$1\frac{18}{10}$	$1\frac{22}{10}$	2
Totals	2	$2\frac{3}{10}$	$2\frac{6}{10}$	$2\frac{10}{10}$	$2\frac{14}{10}$	$2\frac{18}{10}$	$2\frac{22}{10}$	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of haulage, computed at 300d per ton of load	300	300	300	300	300	300	300	300
And at 300d per ton of wagon	300	330	360	400	440	490	540	600
Total charges for a portion of the 1st terminal service of haulage	600	630	660	700	740	790	840	900
Charges for the 2nd terminal service of haulage, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 600d per ton of wagon	600	660	720	800	880	980	1 080	1 200
Charges for that portion of the 1st terminal service of haulage which is performed at 2nd terminal stations, computed at 300d per ton of wagon	300	330	360	400	440	490	540	600
Total charges for the 2nd and a portion of the 1st terminal service of haulage	2 100	2 190	2 280	2 400	2 520	2 670	2 820	3 000
Total charges for the 1st and 2nd terminal services of haulage	2 700	2 820	2 940	3 100	3 260	3 460	3 660	3 900

## RAILWAY COMPANY

*constructed wagons—Charges for the first and second terminal services of haulage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
14 $\frac{11}{10}$	13 $\frac{7}{20}$	12 $\frac{1}{20}$	11	10	9 $\frac{1}{10}$	8 $\frac{1}{2}$	7 $\frac{1}{10}$	6 $\frac{1}{2}$	6 $\frac{1}{20}$	5 $\frac{1}{20}$	5 $\frac{1}{10}$	4 $\frac{13}{20}$
32	32	32	32	32	32	32	32	32	32	32	32	32
10 $\frac{9}{10}$	10	9 $\frac{1}{10}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{20}$	5 $\frac{13}{20}$	5 $\frac{1}{10}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{13}{20}$	3 $\frac{1}{2}$
24	24	24	24	24	24	24	24	24	24	24	24	24
I	I	I	I	I	I	I	I	I	I	I	I	I *
2 $\frac{6}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{7}{10}$	3 $\frac{6}{10}$	3 $\frac{1}{10}$	3 $\frac{7}{10}$	4 $\frac{9}{10}$	4 $\frac{3}{10}$	5 $\frac{6}{10}$	5 $\frac{1}{10}$	6 $\frac{3}{10}$	6 $\frac{13}{10}$
3 $\frac{6}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{7}{10}$	4 $\frac{1}{10}$	4 $\frac{1}{10}$	4 $\frac{7}{10}$	5 $\frac{9}{10}$	5 $\frac{3}{10}$	6 $\frac{1}{10}$	6 $\frac{1}{10}$	7 $\frac{3}{10}$	7 $\frac{13}{10}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
300 660	300 720	300 790	300 870	300 960	300 1 060	300 1 170	300 1 290	300 1 420	300 1 560	300 1 710	300 1 880	300 2 060
960	1 020	1 090	1 170	1 260	1 360	1 470	1 590	1 720	1 860	2 010	2 180	2 360
1 200 1 320	1 200 1 440	1 200 1 580	1 200 1 740	1 200 1 920	1 200 2 120	1 200 2 340	1 200 2 580	1 200 2 840	1 200 3 120	1 200 3 420	1 200 3 760	1 200 4 120
660	720	790	870	960	1 060	1 170	1 290	1 420	1 560	1 710	1 880	2 060
3 180	3 360	3 570	3 810	4 080	4 380	4 710	5 070	5 460	5 880	6 330	6 840	7 380
4 140	4 380	4 660	4 980	5 340	5 740	6 180	6 660	7 180	7 740	8 340	9 020	9 740

## EXAMPLE 19

SOUTH NORTHERN

*Articles of extraordinary weight or dimensions carried in peculiarly.*

NOS OF GRADES	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
CI Distinguishing weights of loads (1)	32	29 $\frac{1}{10}$	26 $\frac{13}{10}$	24	21 $\frac{1}{10}$	19 $\frac{3}{10}$	17 $\frac{1}{2}$	16
Weights of wagons (16 tons + 16 tons for empties)	32	32	32	32	32	32	32	32
CI Distinguishing weights of loads (2)	24	21 $\frac{1}{10}$	20	18	16 $\frac{7}{10}$	14 $\frac{7}{10}$	13 $\frac{7}{10}$	12
Weights of wagons (12 tons + 12 tons for empties)	24	24	24	24	24	24	24	24
Unit-weights of loads	1	1	1	1	1	1	1	1
Proportionate weights of wagons	1	1 $\frac{3}{10}$	1 $\frac{6}{10}$	1 $\frac{10}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{2}{10}$	2
Totals	2	2 $\frac{6}{10}$	2 $\frac{16}{10}$	2 $\frac{10}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of truckage, computed at 300d per ton of load	300	300	300	300	300	300	300	300
And at 300d per ton of wagon	300	330	360	400	440	490	540	600
Total charges for a portion of the 1st terminal service of truckage .	600	630	660	700	740	790	840	900
Charges for the 2nd terminal service of truckage, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 600d per ton of wagon	600	660	720	800	880	980	1 080	1 200
Charges for that portion of the 1st terminal service of truckage which is rendered at 2nd terminal stations, computed at 300d per ton of wagon	300	330	360	400	440	490	540	600
Total charges for the 2nd and a portion of the 1st terminal service of truckage .	2 100	2 190	2 280	2 400	2 520	2 670	2 820	3 000
Total charges for the 1st and 2nd terminal services of truckage	2 700	2 820	2 940	3 100	3 260	3 460	3 660	3 900

## RAILWAY COMPANY

*constructed wagons—Charges for the first and second terminal services of truckage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
14 $\frac{1}{2}$	13 $\frac{1}{2}$	12 $\frac{1}{2}$	11	10	9 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{3}{4}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$
32	32	32	32	32	32	32	32	32	32	32	32	32
10 $\frac{1}{2}$	10	9 $\frac{1}{2}$	8 $\frac{1}{2}$	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{1}{2}$
24	24	24	24	24	24	24	24	24	24	24	24	24
I	I	I	I	I	I	I	I	I	I	I	I	I
2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$
3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.
300 660	300 720	300 790	300 870	300 960	300 1 060	300 1 170	300 1 290	300 1 420	300 1 560	300 1 710	300 1 880	300 2 060
960	1 020	1 090	1 170	1 260	1 360	1 470	1 590	1 720	1 860	2 010	2 180	2 360
1 200 1 320	1 200 1 440	1 200 1 580	1 200 1 740	1 200 1 920	1 200 2 120	1 200 2 340	1 200 2 580	1 200 2 840	1 200 3 120	1 200 3 420	1 200 3 760	1 200 4 120
660	720	790	870	960	1 060	1 170	1 290	1 420	1 560	1 710	1 880	2 060
3 180	3 360	3 570	3 810	4 080	4 380	4 710	5 070	5 460	5 880	6 330	6 840	7 380
4 140	4 380	4 660	4 980	5 340	5 740	6 180	6 660	7 180	7 740	8 340	9 020	9 740

## EXAMPLE 20

SOUTH NORTHERN

*Articles of extraordinary weight or dimensions carried in peculiarly-constructed*

NOS OF GRADES		9	10	11	12	13	14	15	16
Ci. Distinguishing weights of loads (1)		Tons 32	Tons 29 $\frac{1}{10}$	Tons 26 $\frac{1}{10}$	Tons 24	Tons 21 $\frac{1}{2}$	Tons 19 $\frac{1}{2}$	Tons 17 $\frac{1}{2}$	Tons 16
Weights of wagons		16	16	16	16	16	16	16	16
Add the same weights of wagons, to include the weight of empty wagons conveyed		16	16	16	16	16	16	16	16
Total weights of wagons		32	32	32	32	32	32	32	32
Ci. Distinguishing weights of loads (2)		24	21 $\frac{1}{2}$	20	18	16 $\frac{1}{2}$	14 $\frac{1}{2}$	13 $\frac{1}{2}$	12
Weights of wagons		12	12	12	12	12	12	12	12
Add the same weights of wagons, to include the weight of empty wagons conveyed		12	12	12	12	12	12	12	12
Total weights of wagons		24	24	24	24	24	24	24	24
Unit-weights of loads		1	1	1	1	1	1	1	1
Proportionate weights of wagons		1	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	2
Totals		2	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	3
Ref to the Nos of Examples		Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
2	Charges for the 1st and 2nd terminal services of stop- page, including taxes	4 800	5 040	5 280	5 600	5 920	6 320	6 720	7 200
17	Charges for the 1st and 2nd terminal services of railage, including taxes	1 350	1 410	1 470	1 550	1 630	1 730	1 830	1 950
18	Charges for the 1st and 2nd terminal services of haulage	2 700	2 820	2 940	3 100	3 260	3 460	3 660	3 900
19	Charges for the 1st and 2nd terminal services of truck- age	2 700	2 820	2 940	3 100	3 260	3 460	3 660	3 900
6	Charges for two junctional services of stoppage, in- cluding taxes	960	1 008	1 056	1 120	1 184	1 264	1 344	1 440
	Charges for the junctional service of railage, including taxes	060	063	066	070	074	079	084	090
	Charges for the junctional service of haulage	120	126	132	140	148	158	168	180
	Charges for the junctional service of truckage	120	126	132	140	148	158	168	180
8	Charges for the 1st and 2nd terminal services of clerk- age	3 000	3 150	3 300	3 500	3 700	3 950	4 200	4 500
9	Charges for risk	300	312	324	340	356	376	396	420
	Charges for extraneous ser- vices	120	126	132	140	148	158	168	180
Total charges for terminal and junctional services, liabili- ties, and obligations		16 230	17 001	17 772	18 800	19 828	21 113	22 398	23 940

## RAILWAY COMPANY

*wagons—Charges for terminal and junctional services, liabilities, and obligations*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons 14 $\frac{11}{10}$	Tons 13 $\frac{1}{10}$	Tons 12 $\frac{1}{10}$	Tons 11	Tons 10	Tons 9 $\frac{1}{10}$	Tons 8 $\frac{1}{10}$	Tons 7 $\frac{1}{10}$	Tons 6 $\frac{1}{10}$	Tons 5 $\frac{1}{10}$	Tons 4 $\frac{1}{10}$	Tons 3 $\frac{1}{10}$	Tons 2 $\frac{1}{10}$
16	16	16	16	16	16	16	16	16	16	16	16	16
16	16	16	16	16	16	16	16	16	16	16	16	16
32	32	32	32	32	32	32	32	32	32	32	32	32
10 $\frac{1}{10}$	10	9 $\frac{1}{10}$	8 $\frac{1}{10}$	7 $\frac{1}{10}$	6 $\frac{1}{10}$	5 $\frac{1}{10}$	4 $\frac{1}{10}$	3 $\frac{1}{10}$	2 $\frac{1}{10}$	1 $\frac{1}{10}$	0 $\frac{1}{10}$	0 $\frac{1}{10}$
12	12	12	12	12	12	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12
24	24	24	24	24	24	24	24	24	24	24	24	24
1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$	1 $\frac{1}{10}$
2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$	2 $\frac{1}{10}$
3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$	3 $\frac{1}{10}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
7 680	8 160	8 720	9 360	10 080	10 880	11 760	12 720	13 760	14 880	16 080	17 440	18 880
2 070	2 190	2 330	2 490	2 670	2 870	3 090	3 330	3 590	3 870	4 170	4 510	4 870
4 140	4 380	4 660	4 980	5 340	5 740	6 180	6 660	7 180	7 740	8 340	9 020	9 740
4 140	4 380	4 660	4 980	5 340	5 740	6 180	6 660	7 180	7 740	8 340	9 020	9 740
1 536	1 632	1 744	1 872	2 016	2 176	2 352	2 544	2 752	2 976	3 216	3 488	3 776
096	102	109	117	126	136	147	159	172	186	201	218	236
192	204	218	234	252	272	294	318	344	372	402	436	472
192	204	218	234	252	272	294	318	344	372	402	436	472
4 800	5 100	5 430	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900	11 800
444	468	496	528	564	604	648	696	748	804	864	932	1 004
192	204	218	234	252	272	294	318	344	372	402	436	472
25 482	27 024	28 823	30 879	33 192	35 762	38 589	41 673	45 014	48 612	52 467	56 836	61 462

greater weights of loads. The insertion of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will tend to prevent clerks from entering wrong amounts in invoices when the circumstances are as described, and will save the labour of calculation with regard to consignments whose weights correspond with the weights of loads employed to distinguish the grades.



## CHAPTER XIII

### SOUTH NORTHERN RAILWAY COMPANY

#### ARTICLES OF GREAT LENGTH OCCUPYING TWO OR MORE WAGONS

By reason of their length exceeding that of an ordinary wagon, certain articles of merchandise require two or more wagons for their conveyance, and form the fourth division of traffic. When the articles are short enough to be contained in an ordinary wagon they pertain to general merchandise, and must be treated, in all respects, as general merchandise.

Timber is the chief material furnishing articles of great length. Round and squared logs, planks, and boards, are forms in which it is commonly tendered for transmission. Iron beams, columns, girders, shafts, and boilers that do not exceed certain dimensions, as well as other descriptions of merchandise, are also included in this division of traffic. To carry articles of the kind mentioned, railway companies provide short trucks, each of which is fitted with a squared block of wood called a "bolster," transversely laid in the truck when in use, and movable on a pivot fixed centrally in the floor, which, at the same time, holds it in position. The bolsters, to which stanchions and chains are attached for the purpose of propping and binding the loads, stand a little higher than the sides of the trucks in order that the loads may rest entirely upon them. The trucks are built so that two of them, placed end to end, are somewhat longer than the longest wagon designed to carry general merchandise. Frequently, articles forming the load are so long that, although wholly supported on two trucks, they project beyond the end of one of them. In such case, a third truck is employed to act as a "safety" or protective wagon, and, although empty, it accompanies the loaded trucks to the end of the journey, continuing its function of safeguarding the projecting load until the trucks are discharged. To carry long articles, some railway companies build trucks without sides, so as to reduce the extent of upper structure to the lowest point.

Timber is imported in large quantities, and, at many ports, there is a constant demand for trucks adapted to its conveyance. It is also produced in certain districts at home, being usually consigned in the form of round timber, as logs or poles. Owing to the form of their

upper structure, bolster-wagons are not very fit to receive and carry general merchandise; and, at most stations, they cannot be reloaded with suitable merchandise. Being designed for a particular purpose it is expedient that, after discharge, and in the absence of consignments of merchandise meet for them, they should be despatched, empty, to those stations where the appropriate kind of traffic is constantly forthcoming. By this procedure, the trucks may be employed, with regularity, to carry the merchandise intended for them.

Wood differs in specific gravity according to the kind of tree producing it, each consignment of timber usually consisting of one variety. It is requisite to ascertain the greatest weight of load averagely obtainable for two, three, or more wagons, from each description of timber, in the various forms, as round or squared logs, poles, deals, battens, boards, and other shapes, including length, in which it is tendered for conveyance. The same procedure is necessary with regard to iron beams, columns, girders, and other articles carried under like conditions. Protective wagons are as needful as the wagons actually carrying the loads, and, whenever employed, each wagon must be considered as forming one of the number requisite for the conveyance of the load, and its weight must be added to the weight of the other wagons as being equally the occasion of expense.

It is important that the weights of consignments of all kinds of merchandise should be correctly ascertained, and weighing-machines of approved pattern and make are commonly used for the purpose, answering it satisfactorily. The great length of articles under the designation of timber, however, often renders it difficult to obtain the weight in this manner, and it is customary to procure it by a mode of measuring the articles and calculating the cubic contents from the resulting figures; a certain number of cubic feet, according to the kind of wood, being reckoned as weighing 1 ton. Weight obtained in this manner is called measurement weight in contradistinction to machine weight. This method of arriving at the weight is faulty, because timber may be in a green or in a dry state when consigned, and the presence or absence of moisture greatly affects its weight without altering its dimensions.

Timber is usually, but not invariably, consigned in quantities furnishing full loads. The articles consigned, intended to form a load, are often unequal in length, varying, in some instances, to the extent of several feet. Loads obtained from consignments of any kind of merchandise consisting of long and shorter pieces, monopolize loading space without actually occupying it. Also, it may happen that a consignment of merchandise consisting of articles having a length appropriate for two bolster-wagons, will weigh a little more than two trucks are registered to carry, or occupy more loading space than two trucks provide, and that

four bolster-wagons instead of two will have to be employed to carry the consignment. The same conditions might occur in reference to a consignment of merchandise requiring three or more wagons for its conveyance. All these matters have to be taken into account in ascertaining the maximum weight of load averagely obtained from consignments of each kind of merchandise comprised in the fourth division of traffic, when occupying the same number of wagons.

Let it be assumed that merchandise constituting the fourth division of traffic is conveyed from stations to stations in trucks provided by the railway company; and let the symbols  $D_1$  be used to signify that such merchandise is conveyed by one railway company only, under the conditions stated.

Let it be assumed that the greatest weight of load which a bolster-wagon may carry is twice the weight of the wagon itself.

Let it be supposed that the greatest weight of load averagely obtained from articles of each kind of merchandise requiring two or more trucks for their conveyance, is three-fourths of the potential maximum weight of load, whether the load is measured by its weight when partially occupying the loading space or by its weight when wholly occupying the loading space provided by wagons.

Let it be supposed that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed 1 mile, is the same as of 1 to 1, or that the weight of each wagon carrying a load requires to be doubled in order to include the conveyance of empties. Probably, the weight of empty wagons conveyed will not be quite so great, relatively to the weight of loaded wagons conveyed, as is assumed, although it is unlikely to be much less, and may be allowed to pass for the sake of facilitating illustration.

Let it be assumed that the greatest length of wagon built for the purpose of carrying general merchandise is 18 ft., and that articles of merchandise exceeding this length require two or more wagons for their conveyance.

Let it be supposed that bolster-wagons of two sizes are built to carry articles exceeding 18 ft. in length; one size of wagon averagely weighing  $2\frac{3}{4}$  tons, including its accessories, and measuring 10 ft. in length, the other size of wagon averagely weighing  $3\frac{1}{4}$  tons, including its accessories, and measuring 12 ft. in length; and let it be assumed that an equal number of bolster-wagons of each size is provided.

On the grounds supposed, the average weight of bolster-wagon will be 3 tons, the average potential maximum weight of load for each wagon will be 6 tons; and the average maximum weight of load obtained for each wagon from consignments of the heaviest kind of merchandise will be  $4\frac{1}{2}$  tons, or three-quarters of the average potential maximum weight of load. Consequently, by doubling the weights of wagons to

include the conveyance of empties, the weight of wagon proportionate to unit-weight of load, indicated for full loads of the heaviest kind of merchandise in the fourth division of traffic, will be  $1\frac{1}{2}$  ( $1\frac{30}{60}$ ) tons, corresponding to grade 12.

The bolster-wagons, successively placed end to end according to size, will provide space for loads having lengths as follows.—

Two bolster-wagons	10 ft. + 10 ft. = 20 ft.
„ „	10 ft + 12 ft. = 22 ft
„ „	12 ft. + 12 ft = 24 ft.
Three bolster-wagons	10 ft. + 10 ft + 10 ft = 30 ft
„ „	10 ft + 10 ft. + 12 ft. = 32 ft.
„ „	10 ft + 12 ft + 12 ft = 34 ft.
„ „	12 ft. + 12 ft + 12 ft = 36 ft
Four bolster-wagons	10 ft + 10 ft + 10 ft + 10 ft = 40 ft.
„ „	10 ft + 10 ft. + 10 ft + 12 ft. = 42 ft
„ „	10 ft + 10 ft. + 12 ft + 12 ft = 44 ft
„ „	10 ft + 12 ft. + 12 ft. + 12 ft = 46 ft
„ „	12 ft. + 12 ft + 12 ft + 12 ft = 48 ft

Hence—

Articles exceeding 18 ft in length and not exceeding 24 ft. will require two wagons for their conveyance.

Articles exceeding 24 ft. in length and not exceeding 36 ft. will require three wagons for their conveyance

Articles exceeding 36 ft. in length and not exceeding 48 ft will require four wagons for their conveyance, each additional wagon extending the length of loading space by 12 ft.

To make provision for the various magnitudes of consignments, it is necessary that an adequate number of grades should be assigned to the fourth division of traffic. The respective limits of length for full loads when occupying two, three, or more wagons, together with the No. of the appropriate grade, must be stated opposite the name of each description of merchandise, whether consisting of timber, iron, or other material, for the guidance of invoice-clerks and others in the fulfilment of their duties, and for the information of traders. The weights of loads that are less than full loads, furnished by consignments of each kind of merchandise, will approximate to one or other of the weights of loads employed to distinguish succeeding grades, and the rates and charges, calculated for the grade indicated, will apply—with the proviso that a larger amount must not be charged for a less load than for a greater.

Long articles of merchandise that furnish loads for two and three wagons, respectively, form the subject of the next illustration.

Distinguishing weights of loads for more than three wagons might

be added, but those calculated for two and three wagons will suffice for exemplification.

Here it may be noted that, although timber is mostly carried in open wagons, some kinds, after being dressed with tools, require to be covered with tarpaulins to protect them from rain during transport. The use of tarpaulins would have to be provided for by suitably increasing the weights of wagons in the manner already shown, illustratively, with regard to general merchandise when carried in covered wagons, and, consequently, the same weights of loads, when carried covered, would pertain to higher grades, with higher rates and charges, than when carried uncovered.

Let seventeen grades, Nos. 12 to 28, be assigned to the fourth division of traffic, and let the weights of loads chosen to distinguish the grades and to be joined, respectively, with the average weights of two and three bolster-wagons, doubled to include the conveyance of empties, be as follows:—

*Merchandise consisting of articles of great length occupying two and three wagons, respectively, forming the fourth division of traffic.*

Nos of grades	Distinguishing weights of loads to be joined, individually, with 12 tons, or twice the weight of three bolster-wagons, each weighing 3 tons				Successive decreases of weight	Nos of grades	Distinguishing weights of loads to be joined, individually, with 12 tons, or twice the weight of two bolster-wagons, each weighing 3 tons				Successive decreases of weight
	Tons		Tons	cwts qrs			Tons		Tons	cwts qrs	
12	13 $\frac{1}{2}$	or	13	10 0		12	9	or	9	0 0	
13	12 $\frac{1}{10}$	„	12	5 2	I 4 2	13	8 $\frac{7}{10}$	„	8	3 2	0 16 2
14	11	„	11	0 0	I 5 2	14	7 $\frac{7}{10}$	„	7	7 0	0 16 2
15	10	„	10	0 0	I 0 0	15	6 $\frac{3}{10}$	„	6	13 2	0 13 2
16	9	„	9	0 0	I 0 0	16	6	„	6	0 0	0 13 2
17	8 $\frac{7}{10}$	„	8	3 2	0 16 2	17	5 $\frac{9}{10}$	„	5	9 0	0 11 0
18	7 $\frac{1}{2}$	„	7	10 0	0 13 2	18	5	„	5	0 0	0 9 0
19	6 $\frac{3}{10}$	„	6	16 2	0 13 2	19	4 $\frac{1}{10}$	„	4	11 0	0 9 0
20	6 $\frac{1}{10}$	„	6	4 2	0 12 0	20	4 $\frac{1}{10}$	„	4	3 0	0 8 0
21	5 $\frac{5}{10}$	„	5	12 2	0 12 0	21	3 $\frac{1}{2}$	„	3	15 0	0 8 0
22	5 $\frac{1}{10}$	„	5	2 0	0 10 2	22	3 $\frac{1}{2}$	„	3	8 0	0 7 0
23	4 $\frac{5}{10}$	„	4	12 2	0 9 2	23	3 $\frac{1}{10}$	„	3	1 2	0 6 2
24	4 $\frac{1}{10}$	„	4	4 0	0 8 2	24	2 $\frac{1}{2}$	„	2	16 0	0 5 2
25	3 $\frac{5}{10}$	„	3	16 0	0 8 0	25	2 $\frac{1}{10}$	„	2	10 2	0 5 2
26	3 $\frac{1}{10}$	„	3	9 0	0 7 0	26	2 $\frac{1}{10}$	„	2	6 0	0 4 2
27	3 $\frac{1}{10}$	„	3	3 0	0 6 0	27	2 $\frac{1}{10}$	„	2	2 0	0 4 0
28	2 $\frac{1}{5}$	„	2	17 2	0 5 2	28	1 $\frac{1}{10}$	„	1	18 2	0 3 2

Let it be made a condition that if any consignment of merchandise weigh less than the weight of load employed to distinguish the final grade appropriate to the number and weight of wagons in which the consignment is carried, it shall be charged not less than as for such distinguishing weight. Consequently, the minimum weights of loads chargeable for consignments pertaining to the fourth division of traffic, carried in two and three wagons, according to length, will be 2 $\frac{7}{10}$  tons and 1 $\frac{3}{10}$  tons, respectively employed to distinguish grade 28.

The first and second terminal services of portorage, relating to

## EXAMPLE 22

SOUTH NORTHERN

*Articles of great length occupying two and three wagons, respectively—*

Nos. OF GRADES	12	13	14	15	16	17	18
	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>Dr.</b> Distinguishing weights of loads . (1)	13 $\frac{1}{2}$	12 $\frac{1}{4}$	11	10	9	8 $\frac{7}{8}$	7 $\frac{1}{2}$
Weights of three wagons, each averagely weighing 3 tons, doubled, to include empties	18	18	18	18	18	18	18
<b>Dr.</b> Distinguishing weights of loads (2)	9	8 $\frac{7}{8}$	7 $\frac{7}{8}$	6 $\frac{7}{8}$	6	5 $\frac{9}{10}$	5
Weights of two wagons, each averagely weighing 3 tons, doubled, to include empties	12	12	12	12	12	12	12
Unit-weights of loads	1	1	1	1	1	1	1
Proportionate weights of wagons	1 $\frac{9}{10}$	1 $\frac{4}{5}$	1 $\frac{9}{10}$	1 $\frac{3}{4}$	2	2 $\frac{7}{10}$	2 $\frac{1}{2}$
Totals	2 $\frac{9}{10}$	2 $\frac{1}{5}$	2 $\frac{9}{10}$	2 $\frac{1}{4}$	3	3 $\frac{7}{10}$	3 $\frac{3}{5}$
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st terminal service of portorage, computed at 3 000 <i>d</i> per ton of load	3 000	3 000	3 000	3 000	3 000	3 000	3 000
And at 750 <i>d</i> per ton of wagon . .	1 000	1 100	1 225	1 350	1 500	1 650	1 800
Total charges for the 1st terminal service of portorage .	4 000	4 100	4 225	4 350	4 500	4 650	4 800
Charges for the 2nd terminal service of portorage, computed at 3 000 <i>d</i> per ton of load . .	3 000	3 000	3 000	3 000	3 000	3 000	3 000
And at 750 <i>d</i> per ton of wagon	1 000	1 100	1 225	1 350	1 500	1 650	1 800
Total charges for the 2nd terminal service of portorage .	4 000	4 100	4 225	4 350	4 500	4 650	4 800
Total charges for the 1st and 2nd terminal services of portorage	8 000	8 200	8 450	8 700	9 000	9 300	9 600

## RAILWAY COMPANY

*Charges for first and second terminal services of porters*

19	20	21	22	23	24	25	26	27	28
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
6 $\frac{3}{4}$	6 $\frac{1}{4}$	5 $\frac{3}{4}$	5 $\frac{1}{4}$	4 $\frac{3}{4}$	4 $\frac{1}{4}$	3 $\frac{3}{4}$	3 $\frac{1}{4}$	3 $\frac{3}{4}$	2 $\frac{3}{4}$
18	18	18	18	18	18	18	18	18	18
4 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{3}{4}$
12	12	12	12	12	12	12	12	12	12
I	I	I	I	I	I	I	I	I	I
2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$
3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
1 975	2 175	2 400	2 650	2 925	3 225	3 550	3 900	4 275	4 700
4 975	5 175	5 400	5 650	5 925	6 225	6 550	6 900	7 275	7 700
3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
1 975	2 175	2 400	2 650	2 925	3 225	3 550	3 900	4 275	4 700
4 975	5 175	5 400	5 650	5 925	6 225	6 550	6 900	7 275	7 700
9 950	10 350	10 800	11 300	11 850	12 450	13 100	13 800	14 550	15 400

merchandise in the fourth division of traffic, are performed by the railway company; the staffs of men employed to load and unload wagons used to carry general merchandise being competent to discharge the same duties with regard to articles of great length, occupying two or more wagons. It is expedient that the weights of wagons carrying the loads, as well as the weights of loads, should enter into the computation of charges for the services of portorage, following the course taken with respect to general merchandise, the same sums being employed as factors in the process. Inasmuch, however, as the weights of empty wagons, added to the weights of loaded wagons, apart from the loads, are relatively greater for merchandise in the fourth than for merchandise in the first and second divisions of traffic, the degree of correction necessary will, consequently, be greater also, and an additional Example is required in order that the charges for the services of portorage may be appropriately calculated and shown.

Let the sums chosen to compute charges for each terminal service of portorage, performed in reference to merchandise in the fourth division of traffic, be 3000*l.* per ton of load and 1500*l.* per ton of wagon carrying the load, including profit. To correct the weights added for empties by proceeding in the same manner as before, let 750*l.* per ton, or one-half of 1500*l.* be employed as a factor with the unaltered weights of wagons, in computing charges for each terminal service of portorage.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of portorage, performed in reference to merchandise consisting of articles of great length, occupying two and three wagons, respectively, are shown in Example 22 (pp 214-215).

Excepting the performance of the service of portorage, the conditions of transport assumed to exist in reference to merchandise in the fourth division of traffic correspond with the conditions assumed to exist with regard to merchandise in the third division of traffic, the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, being supposed to be the same for each division. Therefore, by adding the charges for the first and second terminal services of portorage, contained in Example 22, to the charges for terminal and junctional services, liabilities, and obligations, computed for grades 12 to 28, contained in Example 20, which relate to merchandise forming the third division of traffic, a complete list of charges, applicable to merchandise in the fourth division of traffic, will be obtained.

Acting in the manner indicated, a complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to articles of great length that occupy two or more wagons, is given in Example 23,



the first of the two Examples immediately following. Reference to the No. of Example whence the charges have been taken is entered opposite the name of each kind of service, liability, and obligation.

Example 24 constitutes a complete Table (Table III) of Rates and Charges, per ton of load, for merchandise comprised in the fourth division of traffic, conveyed from stations to stations in wagons provided by the railway company. It is prepared by adding the rates for consecutive distances calculated for grades 12 to 28, inclusive, contained in Example 11, to the total charges contained in Example 23, to form scales of united rates and charges, stated in shillings and pence, together with the consecutive distances, embracing 1 to 200 miles, to which they apply. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence. The consecutive distances correspond with those adopted for general merchandise; the rate of progression being increased, after 15 miles, from one to two miles, and after 65 miles, from two to three miles.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be computed and entered in the manner shown in the Example.

The amounts due for the transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads, distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will enable clerks to avoid entering wrong amounts in invoices when the circumstances are as described, and will save the labour of calculation with regard to consignments whose weights correspond with the weights of loads employed to distinguish the grades.

## EXAMPLE 23

SOUTH NORTHERN

*Articles of great length occupying two and three wagons, respectively—*

NOS OF GRADES		I2	I3	I4	I5	I6	I7
		Tons 13½	Tons 12½	Tons 11	Tons 10	Tons 9	Tons 8½
Dr.	Distinguishing weights of loads (1)						
	Weights of three wagons, each averagely weighing 3 tons	9	9	9	9	9	9
	Add the same weights of three wagons, to include the weight of empty wagons conveyed	9	9	9	9	9	9
	Total weights of wagons	18	18	18	18	18	18
Dr.	Distinguishing weights of loads (2)	9	8½	7½	6½	6	5½
	Weights of two wagons, each averagely weighing 3 tons	6	6	6	6	6	6
	Add the same weights of two wagons, to include the weight of empty wagons conveyed	6	6	6	6	6	6
	Total weights of wagons	12	12	12	12	12	12
	Unit-weights of loads	1 1½	1 1½	1 1½	1 1½	1 2	1 2½
	Proportionate weights of wagons						
	Totals	2½	2½	2½	2½	3	3½
Ref to the Nos of Examples		Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
2	Charges for the 1st and 2nd terminal services of stoppage, including taxes	5 600	5 920	6 320	6 720	7 200	7 680
17	Charges for the 1st and 2nd terminal services of railrage, including taxes	1 550	1 630	1 730	1 830	1 950	2 070
18	Charges for the 1st and 2nd terminal services of haulage	3 100	3 260	3 460	3 660	3 900	4 140
19	Charges for the 1st and 2nd terminal services of truckage	3 100	3 260	3 460	3 660	3 900	4 140
	Charges for two junctional services of stoppage, including taxes	1 120	1 184	1 264	1 344	1 440	1 536
6	Charges for the junctional service of railrage, including taxes	070	074	079	084	090	096
	Charges for the junctional service of haulage	140	148	158	168	180	192
	Charges for the junctional service of truckage	140	148	158	168	180	192
22	Charges for the 1st and 2nd terminal services of portorage	8 000	8 200	8 450	8 700	9 000	9 300
8	Charges for the 1st and 2nd terminal services of clerkage	3 500	3 700	3 950	4 200	4 500	4 800
9	Charges for risk	340	356	376	396	420	444
	Charges for extraneous services	140	148	158	168	180	192
	Total charges for terminal and junctional services, liabilities, and obligations	26 800	28 028	29 563	31 098	32 940	34 782

## RAILWAY COMPANY

*Charges for terminal and junctional services, liabilities, and obligations*

18	19	20	21	22	23	24	25	26	27	28
Tons 7 $\frac{1}{2}$	Tons 6 $\frac{1}{4}$	Tons 6 $\frac{1}{4}$	Tons 5 $\frac{1}{2}$	Tons 5 $\frac{1}{4}$	Tons 4 $\frac{1}{2}$	Tons 4 $\frac{1}{4}$	Tons 3 $\frac{1}{4}$	Tons 3 $\frac{1}{4}$	Tons 3 $\frac{1}{4}$	Tons 2 $\frac{1}{4}$
9	9	9	9	9	9	9	9	9	9	9
9	9	9	9	9	9	9	9	9	9	9
18	18	18	18	18	18	18	18	18	18	18
5	4 $\frac{1}{4}$	4 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{4}$	1 $\frac{1}{4}$
6	6	6	6	6	6	6	6	6	6	6
6	6	6	6	6	6	6	6	6	6	6
12	12	12	12	12	12	12	12	12	12	12
1 2 $\frac{1}{4}$	1 2 $\frac{1}{4}$	1 2 $\frac{1}{4}$	1 3 $\frac{1}{4}$	1 3 $\frac{1}{4}$	1 3 $\frac{1}{4}$	1 4 $\frac{1}{4}$	1 4 $\frac{1}{4}$	1 5 $\frac{1}{4}$	1 5 $\frac{1}{4}$	1 6 $\frac{1}{4}$
3 $\frac{1}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	5 $\frac{1}{4}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{4}$
Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$
8 160	8 720	9 360	10 080	10 880	11 760	12 720	13 760	14 880	16 080	17 440
2 190	2 330	2 490	2 670	2 870	3 090	3 330	3 590	3 870	4 170	4 510
4 380	4 660	4 980	5 340	5 740	6 180	6 660	7 180	7 740	8 340	9 020
4 380	4 660	4 980	5 340	5 740	6 180	6 660	7 180	7 740	8 340	9 020
1 632	1 741	1 872	2 016	2 176	2 352	2 544	2 752	2 976	3 216	3 488
102	109	117	126	136	147	159	172	186	201	218
204	218	234	252	272	294	318	344	372	402	436
204	218	234	252	272	294	318	344	372	402	436
9 600	9 950	10 350	10 800	11 300	11 850	12 450	13 100	13 800	14 550	15 400
5 100	5 450	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900
468	496	528	564	604	648	696	748	804	864	932
204	218	234	252	272	294	318	344	372	402	436
36 624	38 773	41 229	43 992	47 062	50 439	54 123	58 114	62 412	67 017	72 236

## EXAMPLE 24

SOUTH NORTHERN

*Articles of great length occupying two and three wagons,*

•NOS OF GRADES		12	13	14	15	16	17
Tons		Tons	Tons	Tons	Tons	Tons	Tons
13 <sup>1</sup> <sub>4</sub>		12 <sup>1</sup> <sub>4</sub>	11	10	9	8 <sup>7</sup> <sub>4</sub>	
18		18	18	18	18	18	18
Dr. Distinguishing weights of loads (1)		9	8 <sup>7</sup> <sub>4</sub>	7 <sup>7</sup> <sub>4</sub>	6 <sup>1</sup> <sub>4</sub>	6	5 <sup>9</sup> <sub>4</sub>
Average weights of three wagons		12	12	12	12	12	12
(9 tons + 9 tons for empties)							
Dr. Distinguishing weights of loads (2)		1	1 <sup>1</sup> <sub>4</sub>	1 <sup>1</sup> <sub>4</sub>	1 <sup>3</sup> <sub>4</sub>	1	1
Average weights of two wagons		1 <sup>1</sup> <sub>4</sub>	1 <sup>1</sup> <sub>4</sub>	1 <sup>1</sup> <sub>4</sub>	1 <sup>3</sup> <sub>4</sub>	2	2 <sup>1</sup> <sub>4</sub>
(6 tons + 6 tons for empties)							
Unit-weights of loads		2 <sup>1</sup> <sub>4</sub>	2 <sup>1</sup> <sub>4</sub>	2 <sup>1</sup> <sub>4</sub>	2 <sup>3</sup> <sub>4</sub>	3	3 <sup>1</sup> <sub>4</sub>
Proportionate weights of wagons *							
Totals							
Ref to the Nos of Examples 22	Total charges for terminal and junctional services, liabilities, and obligations	26 800	28 028	29 563	31 098	32 940	34 782
	Rates for the initial distance, in- cluding taxes	70	74	79	84	90	96
Rates of progression	Consecutive distances	United rates and					
	No of scales						
1 mile	Not exceeding 1 mile	1					
	Over 1 mile and not exceeding 2 miles	2					
1 mile	2 miles	3					
	3 "	4					
1 mile	4 "	5					
	5 "	6					
1 mile	6 "	7					
	7 "	8					
1 mile	8 "	9					
	9 "	10					
1 mile	10 "	11					
	11 "	12					
1 mile	12 "	13					
	13 "	14					
1 mile	14 "	15					
	* (1) (Amounts per load)	41 8	39 11	37 7	36 8	34 6	33 5
1 mile	(2) (Amounts per load)	27 9	26 7	25 1	24 6	23 0	22 3
2 miles	15 "	16					
	17 "	18					
2 miles	19 "	20					
	21 "	22					
2 miles	23 "	24					
	25 "	26					
2 miles	27 "	28					
	29 "	30					
2 miles	31 "	32					
	33 "	34					
2 miles	35 "	36					
	37 "	38					
2 miles	39 "	40					
	41 "	42					
2 miles	43 "	44					
	45 "	46					

RAILWAY COMPANY

respectively—United rates and charges for consecutive distances

18	19	20	21	22	23	24	25	26	27	28
Tons 7½	Tons 6¾	Tons 6¼	Tons 5¾	Tons 5½	Tons 4¾	Tons 4½	Tons 3¾	Tons 3½	Tons 3¼	Tons 2¾
18	18	18	18	18	18	18	18	18	18	18
5	4½	4¼	3¾	3½	3¼	2¾	2½	2¼	2½	1¾
12	12	12	12	12	12	12	12	12	12	12
1 2½	1 2½	1 2½	1 3½	1 3½	1 3½	1 4½	1 4½	1 5½	1 5½	1 6½
3½	3½	3½	4½	4½	4½	5½	5½	6½	6½	7½
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
36 624	38 773	41 229	43 992	47 062	50 439	54 123	58 114	62 412	67 017	72 236
1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18

charges per ton of load

s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d
3 2	3 4	3 6	3 9	4 0	4 4	4 8	5 0	5 4	5 9	6 2
3 3	3 5	3 8	3 11	4 2	4 5	4 9	5 2	5 6	5 11	6 5
3 4	3 6	3 9	4 0	4 3	4 7	4 11	5 3	5 8	6 1	6 7
3 5	3 7	3 10	4 1	4 5	4 8	5 0	5 5	5 10	6 3	6 9
3 6	3 8	3 11	4 2	4 6	4 10	5 2	5 7	6 0	6 5	6 11
3 7	3 9	4 0	4 4	4 7	4 11	5 4	5 8	6 2	6 7	7 1
3 8	3 10	4 1	4 5	4 9	5 1	5 5	5 10	6 3	6 9	7 3
3 9	3 11	4 3	4 6	4 10	5 2	5 7	6 0	6 5	6 11	7 6
3 10	4 1	4 4	4 7	4 11	5 4	5 8	6 2	6 7	7 1	7 8
3 11	4 2	4 5	4 9	5 1	5 5	5 10	6 3	6 9	7 3	7 10
4 0	4 3	4 6	4 10	5 2	5 7	6 0	6 5	6 11	7 5	8 0
4 1	4 4	4 7	4 11	5 3	5 8	6 1	6 7	7 1	7 7	8 2
4 2	4 5	4 8	5 0	5 5	5 10	6 3	6 8	7 3	7 9	8 5
4 3	4 6	4 10	5 2	5 6	5 11	6 4	6 10	7 4	7 11	8 7
4 4	4 7	4 11	5 3	5 7	6 0	6 6	7 0	7 6	8 1	8 9
32 6	31 3	30 7	29 6	28 6	27 9	27 4	26 7	25 11	25 6	25 2
21 8	20 10	20 5	19 8	19 0	18 5	18 2	17 8	17 3	17 0	16 10
4 5	4 8	5 0	5 4	5 9	6 2	6 8	7 2	7 8	8 3	8 11
4 7	4 10	5 2	5 7	6 0	6 5	6 11	7 5	8 0	8 7	9 3
4 9	5 1	5 5	5 9	6 2	6 8	7 2	7 9	8 4	8 11	9 8
4 11	5 3	5 7	6 0	6 5	6 11	7 5	8 0	8 7	9 3	10 0
5 1	5 5	5 9	6 2	6 8	7 2	7 8	8 3	8 11	9 7	10 5
5 3	5 7	6 0	6 5	6 10	7 5	7 11	8 7	9 3	9 11	10 9
5 5	5 9	6 2	6 7	7 1	7 8	8 3	8 10	9 6	10 3	11 1
5 7	5 11	6 4	6 10	7 4	7 11	8 6	9 2	9 10	10 7	11 6
5 9	6 2	6 7	7 0	7 7	8 1	8 9	9 5	10 2	10 11	11 10
5 11	6 4	6 9	7 3	7 9	8 4	9 0	9 9	10 6	11 3	12 2
6 1	6 6	6 11	7 5	8 0	8 7	9 3	10 0	10 9	11 7	12 7
6 3	6 8	7 2	7 8	8 3	8 10	9 7	10 3	11 1	11 11	12 11
6 5	6 10	7 4	7 10	8 5	9 1	9 10	10 7	11 5	12 3	13 3
6 7	7 1	7 6	8 1	8 8	9 4	10 1	10 10	11 9	12 7	13 8
6 10	7 3	7 9	8 3	8 11	9 7	10 4	11 2	12 0	12 11	14 0

## EXAMPLE 24 (continued)

NOS OF GRADES			12	13	14	15	16	17		
			Tons 13½	Tons 12¾	Tons 11	Tons 10	Tons 9	Tons 8¾		
Dr. Distinguishing weights of loads (1) Average weights of three wagons (9 tons + 9 tons for empties)			18	18	18	18	18	18		
Dr. Distinguishing weights of loads (2) Average weights of two wagons (6 tons + 6 tons for empties)			9	8¾	7¾	6¾	6	5¾		
			12	12	12	12	12	12		
Unit-weights of loads Proportionate weights of wagons			1 1½	1 1½	1 1½	1 1½	1 2	1 2½		
Totals			2½	2½	2½	2½	3	3½		
Ref to the Nos of Example 22	Total charges for terminal and junctional services, liabilities, and obligations		Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d		
			26 800	28 028	29 563	31 098	32 940	34 782		
I	Rates for the initial distance, including taxes		70	74	79	84	90	96		
Rates of progression	Consecutive distances		Nos of scales		United rates and					
					s d	s d	s d	s d		
2 miles	Over 45 miles and not exceeding 47 miles		46		4 11	5 2	5 6	5 10	6 2	6 7
	" 47 " " "	49 "	48		5 0	5 4	5 7	5 11	6 4	6 9
	" 49 " " "	51 "	50		5 2	5 5	5 9	6 1	6 6	6 11
	" 51 " " "	53 "	52		5 3	5 7	5 11	6 3	6 8	7 1
	" 53 " " "	55 "	54		5 5	5 8	6 0	6 4	6 10	7 3
	" 55 " " "	57 "	56		5 6	5 9	6 2	6 6	6 11	7 5
	" 57 " " "	59 "	58		5 7	5 11	6 3	6 8	7 1	7 6
	" 59 " " "	61 "	60		5 9	6 0	6 5	6 9	7 3	7 8
	" 61 " " "	63 "	62		5 10	6 2	6 7	6 11	7 5	7 10
	" 63 " " "	65 "	64		6 0	6 3	6 8	7 1	7 7	8 0
	(1)	{ Amounts per load }	81 0	76 9	73 4	70 10	68 3	65 5		
	(2)	{ Amounts per load }	54 0	51 1	49 0	47 3	45 6	43 7		
3 miles	" 65 " " "	68 "	67		6 2	6 6	6 10	7 3	7 9	8 3
	" 68 " " "	71 "	70		6 4	6 8	7 1	7 6	8 0	8 6
	" 71 " " "	74 "	73		6 6	6 10	7 3	7 8	8 3	8 9
	" 74 " " "	77 "	76		6 8	7 0	7 6	7 11	8 5	9 0
	" 77 " " "	80 "	79		6 10	7 2	7 8	8 1	8 8	9 3
	" 80 " " "	83 "	82		7 0	7 5	7 10	8 4	8 11	9 6
	" 83 " " "	86 "	85		7 2	7 7	8 1	8 6	9 1	9 8
	" 86 " " "	89 "	88		7 4	7 9	8 3	8 9	9 4	9 11
	" 89 " " "	92 "	91		7 7	7 11	8 5	9 0	9 7	10 2
	" 92 " " "	95 "	94		7 9	8 2	8 8	9 2	9 10	10 5
	" 95 " " "	98 "	97		7 11	8 4	8 10	9 5	10 0	10 8
	" 98 " " "	101 "	100		8 1	8 6	9 1	9 7	10 3	10 11
	" 101 " " "	104 "	103		8 3	8 8	9 3	9 10	10 6	11 2
	" 104 " " "	107 "	106		8 5	8 10	9 5	10 0	10 8	11 5
	" 107 " " "	110 "	109		8 7	9 1	9 8	10 3	10 11	11 7
	" 110 " " "	113 "	112		8 9	9 3	9 10	10 5	11 2	11 10
	" 113 " " "	116 "	115		8 11	9 5	10 0	10 8	11 4	12 1
	" 116 " " "	119 "	118		9 1	9 7	10 3	10 10	11 7	12 4
	" 119 " " "	122 "	121		9 4	9 10	10 5	11 1	11 10	12 7
	" 122 " " "	125 "	124		9 6	10 0	10 8	11 3	12 1	12 10

18	19	20	21	22	23	24	25	26	27	28
Tons 7½	Tons 6¾	Tons 6¾	Tons 5½	Tons 5½	Tons 4½	Tons 4½	Tons 3½	Tons 3½	Tons 3½	Tons 2½
18	18	18	18	18	18	18	18	18	18	18
5	4½	4½	3½	3½	3½	2½	2½	2½	2½	1½
12	12	12	12	12	12	12	12	12	12	12
I 2½	I 2½	I 2½	I 3½	I 3½	I 3½	I 4½	I 4½	I 5½	I 5½	I 6½
3½	3½	3½	4½	4½	4½	5½	5½	6½	6½	7½
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
36 624	38 773	41 229	43 992	47 062	50 439	54 123	58 114	62 412	67 017	72 236
1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18

charges per ton of load

s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d
7 0	7 5	7 11	8 6	9 2	9 10	10 7	11 5	12 4	13 3	14 5	15 10
7 2	7 7	8 1	8 8	9 4	10 1	10 10	11 9	12 8	13 7	14 9	15 11
7 4	7 9	8 4	8 11	9 7	10 4	11 2	12 0	12 11	14 0	15 1	16 6
7 6	7 11	8 6	9 2	9 10	10 7	11 5	12 4	13 3	14 4	15 6	16 11
7 8	8 2	8 8	9 4	10 1	10 10	11 8	12 7	13 7	14 8	15 10	16 12
7 10	8 4	8 11	9 7	10 3	11 1	11 11	12 10	13 11	15 0	16 2	17 3
8 0	8 6	9 1	9 9	10 6	11 4	12 2	13 2	14 2	15 4	16 7	17 8
8 2	8 8	9 3	10 0	10 9	11 7	12 6	13 5	14 6	15 8	16 11	17 13
8 4	8 10	9 6	10 2	10 11	11 10	12 9	13 9	14 10	16 0	17 3	18 5
8 6	9 1	9 8	10 5	11 2	12 1	13 0	14 0	15 1	16 4	17 8	18 10
63 9	62 0	60 2	58 7	56 11	55 11	54 7	53 2	52 0	51 5	50 10	49 10
42 6	41 4	40 1	39 1	38 0	37 2	36 5	35 4	34 8	34 4	34 0	33 10
8 9	9 4	10 0	10 8	11 6	12 5	13 5	14 5	15 7	16 10	18 2	19 4
9 0	9 7	10 3	11 0	11 10	12 9	13 9	14 11	16 1	17 4	18 9	19 11
9 3	9 10	10 7	11 4	12 2	13 2	14 2	15 4	16 6	17 10	19 3	20 5
9 6	10 2	10 10	11 8	12 6	13 6	14 7	15 9	17 0	18 4	19 10	20 12
9 9	10 5	11 2	12 0	12 11	13 11	15 0	16 2	17 5	18 10	20 4	21 6
10 0	10 8	11 5	12 3	13 3	14 3	15 5	16 7	17 11	19 4	20 11	21 13
10 3	10 11	11 9	12 7	13 7	14 7	15 9	17 0	18 5	19 10	21 6	22 8
10 6	11 3	12 0	12 11	13 11	15 0	16 2	17 5	18 10	20 4	22 0	23 2
10 9	11 6	12 4	13 3	14 3	15 4	16 7	17 11	19 4	20 10	22 7	23 9
11 1	11 9	12 7	13 6	14 7	15 9	17 0	18 4	19 9	21 4	23 1	24 3
11 4	12 1	12 11	13 10	14 11	16 1	17 4	18 9	20 3	21 10	23 8	24 10
11 7	12 4	13 2	14 2	15 3	16 5	17 9	19 2	20 8	22 4	24 2	25 4
11 10	12 7	13 6	14 6	15 7	16 10	18 2	19 7	21 2	22 10	24 9	25 11
12 1	12 10	13 9	14 10	15 11	17 2	18 7	20 0	21 8	23 4	25 3	26 5
12 4	13 2	14 1	15 1	16 3	17 7	18 11	20 6	22 1	23 10	25 10	26 12
12 7	13 5	14 4	15 5	16 7	17 11	19 4	20 11	22 7	24 4	26 4	27 6
12 10	13 8	14 8	15 9	16 11	18 3	19 9	21 4	23 0	24 10	26 11	27 13
13 1	13 11	14 11	16 1	17 4	18 8	20 2	21 9	23 6	25 4	27 5	28 7
13 4	14 3	15 3	16 4	17 8	19 0	20 7	22 2	23 11	25 10	28 0	29 2
13 7	14 6	15 6	16 8	18 0	19 5	20 11	22 7	24 5	26 4	28 7	29 9

## EXAMPLE 24 (continued)

NOS OF GRADES			12	13	14	15	16	17	
Dr. Distinguishing weights of loads (1)	Average weights of three wagons (9 tons - 9 tons for empties)		Tons 13½	Tons 12¼	Tons 11	Tons 10	Tons 9	Tons 8½	
			18	18	18	18	18	18	
Dr. Distinguishing weights of loads (2)	Average weights of two wagons (6 tons + 6 tons for empties)		9	8½	7½	6½	6	5½	
			12	12	12	12	12	12	
Unit-weights of loads			1	1	1	1	1	1	
Proportionate weights of wagons			1½	1½	1½	1½	2	2½	
Totals			2½	2½	2½	2½	3	3½	
Ref to the Nos of Examples 22	Total charges for terminal and junctional services, liabilities, and obligations		Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	
			26 800	28 028	29 563	31 098	32 940	34 782	
I	Rates for the initial distance, including taxes		70	74	79	84	90	96	
Rates of progression	Consecutive distances		United rates and						
	Nos of scales								
3 miles	Over 125 miles and not exceeding 128 miles		127	s d 9 8	s d 10 2	s d 10 10	s d 11 6	s d 12 3	s d 13 1
	" 128 " " " 131 "		130	9 10	10 4	11 0	11 8	12 6	13 4
	" 131 " " " 134 "		133	10 0	10 6	11 3	11 11	12 9	13 6
	" 134 " " " 137 "		136	10 2	10 9	11 5	12 1	12 11	13 9
	" 137 " " " 140 "		139	10 4	10 11	11 7	12 4	13 2	14 0
	(1) {Amounts per load}		139 6	134 0	127 5	123 4	118 6	114 5	
	(2) {Amounts per load}		93 0	89 3	85 2	82 4	79 0	76 4	
	" 140 " " " 143 "		142	10 6	11 1	11 10	12 6	13 5	14 3
	" 143 " " " 146 "		145	10 8	11 3	12 0	12 9	13 7	14 6
	" 146 " " " 149 "		148	10 10	11 6	12 2	12 11	13 10	14 9
	" 149 " " " 152 "		151	11 1	11 8	12 5	13 2	14 1	15 0
	" 152 " " " 155 "		154	11 3	11 10	12 7	13 4	14 4	15 3
	" 155 " " " 158 "		157	11 5	12 0	12 10	13 7	14 6	15 6
	" 158 " " " 161 "		160	11 7	12 2	13 0	13 9	14 9	15 8
	" 161 " " " 164 "		163	11 9	12 5	13 2	14 0	15 0	15 11
	" 164 " " " 167 "		166	11 11	12 7	13 5	14 3	15 2	16 2
	" 167 " " " 170 "		169	12 1	12 9	13 7	14 5	15 5	16 5
	" 170 " " " 173 "		172	12 3	12 11	13 9	14 8	15 8	16 8
	" 173 " " " 176 "		175	12 5	13 2	14 0	14 10	15 10	16 11
	" 176 " " " 179 "		178	12 7	13 4	14 2	15 1	16 1	17 2
	" 179 " " " 182 "		181	12 10	13 6	14 5	15 3	16 4	17 5
	" 182 " " " 185 "		184	13 0	13 8	14 7	15 6	16 7	17 7
" 185 " " " 188 "		187	13 2	13 10	14 9	15 8	16 9	17 10	
" 188 " " " 191 "		190	13 4	14 1	15 0	15 11	17 0	18 1	
" 191 " " " 194 "		193	13 6	14 3	15 2	16 1	17 3	18 4	
" 194 " " " 197 "		196	13 8	14 5	15 4	16 4	17 5	18 7	
" 197 " " " 200 "		199	13 10	14 7	15 7	16 6	17 8	18 10	
(1) {Amounts per load}		186 9	179 0	171 5	165 0	159 0	154 0		
(2) {Amounts per load}		124 6	119 3	114 6	110 2	106 0	102 8		



18	19	20	21	22	23	24	25	26	27	28
Tons 7½	Tons 6¼	Tons 6¼	Tons 5¾	Tons 5½	Tons 4¾	Tons 4½	Tons 3¾	Tons 3½	Tons 3¼	Tons 2¾
18	18	18	18	18	18	18	18	18	18	18
5	4½	4¼	3¾	3½	3¼	2¾	2½	2¼	2¼	1¾
12	12	12	12	12	12	12	12	12	12	12
I 2½	I 2½	I 2¾	I 3¼	I 3½	I 3¾	I 4¼	I 4¾	I 5¼	I 5½	I 6¾
3½	3½	3¾	4¼	4½	4¾	5¼	5¾	6¼	6¾	7¾
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
36 624	38 773	41 229	43 992	47 062	50 439	54 123	58 114	62 412	67 017	72 236
I 02	I 09	I 17	I 26	I 36	I 47	I 59	I 72	I 86	2 01	2 18

charges per ton of load

s d 13 10	s d 14 9	s d 15 10	s d 17 0	s d 18 4	s d 19 9	s d 21 4	s d 23 1	s d 24 11	s d 26 10	s d 29 1
14 1	15 0	16 1	17 4	18 8	20 2	21 9	23 6	25 4	27 4	29 8
14 4	15 4	16 5	17 8	19 0	20 6	22 2	23 11	25 10	27 10	30 2
14 7	15 7	16 8	17 11	19 4	20 10	22 6	24 4	26 3	28 4	30 9
14 10	15 10	17 0	18 3	19 8	21 3	22 11	24 9	26 9	28 10	31 3
111 3	108 1	105 10	102 8	100 4	98 3	96 3	94 1	92 3	90 10	89 10
74 2	72 1	70 7	68 5	66 10	65 4	64 2	62 6	61 6	60 7	60 2
15 1	16 2	17 3	18 7	20 0	21 7	23 4	25 2	27 3	29 4	31 10
15 5	16 5	17 7	18 11	20 4	22 0	23 9	25 8	27 8	29 10	32 4
15 8	16 8	17 10	19 2	20 8	22 4	24 1	26 1	28 2	30 4	32 11
15 11	16 11	18 2	19 6	21 0	22 8	24 6	26 6	28 7	30 11	33 5
16 2	17 3	18 5	19 10	21 5	23 1	24 11	26 11	29 1	31 5	34 0
16 5	17 6	18 9	20 2	21 9	23 5	25 4	27 4	29 6	31 11	34 6
16 8	17 9	19 0	20 6	22 1	23 10	25 9	27 9	30 0	32 5	35 1
16 11	18 0	19 4	20 9	22 5	24 2	26 1	28 2	30 6	32 11	35 8
17 2	18 4	19 7	21 1	22 9	24 6	26 6	28 8	30 11	33 5	36 2
17 5	18 7	19 11	21 5	23 1	24 11	26 11	29 1	31 5	33 11	36 9
17 8	18 10	20 2	21 9	23 5	25 3	27 4	29 6	31 10	34 5	37 3
17 11	19 2	20 6	22 0	23 9	25 8	27 8	29 11	32 4	34 11	37 10
18 2	19 5	20 9	22 4	24 1	26 0	28 1	30 4	32 9	35 5	38 4
18 5	19 8	21 1	22 8	24 5	26 5	28 6	30 9	33 3	35 11	38 11
18 8	19 11	21 5	23 0	24 9	26 9	28 11	31 3	33 9	36 5	39 5
18 11	20 3	21 8	23 4	25 1	27 1	29 3	31 8	34 2	36 11	40 0
19 2	20 6	22 0	23 7	25 5	27 6	29 8	32 1	34 8	37 5	40 6
19 5	20 9	22 3	23 11	25 10	27 10	30 1	32 6	35 1	37 11	41 1
19 9	21 0	22 7	24 3	26 2	28 3	30 6	32 11	35 7	38 5	41 8
20 0	21 4	22 10	24 7	26 6	28 7	30 11	33 4	36 1	38 11	42 2
150 0	145 7	142 2	138 3	135 2	132 2	129 10	126 8	124 6	122 7	121 3
100 0	97 1	94 9	92 2	90 1	87 11	86 7	84 2	83 0	81 9	81 2

## CHAPTER XIV

### SOUTH NORTHERN RAILWAY COMPANY

#### COAL, LIME, ETC., CARRIED IN WAGONS PROVIDED BY THE RAILWAY COMPANY

IN the Annual Returns furnished by the Board of Trade, in reference to railways, goods traffic is dealt with under the three heads of minerals, general merchandise, and live stock. The weights and receipts respectively shown for the years 1896 to 1905, inclusive, embracing all the railway companies in the United Kingdom, are as follows:—

Years	WRIGHTS			RECEIPTS		
	Minerals	General Merchandise	Live Stock	Minerals	General Merchandise	Live Stock
	Tons	Tons	Tons	£	£	£
1896	254,671,184	101,796,825	Not given	18,930,796	25,901,425	1,343,114
1897	266,912,800	107,469,466	„	19,746,560	26,736,973	1,372,939
1898	267,778,462	110,784,623	„	20,256,373	27,583,188	1,379,271
1899	296,611,190	117,011,835	„	21,834,477	28,861,220	1,421,297
1900	306,389,083	118,540,430	„	22,870,694	29,165,108	1,434,762
1901	298,030,644	117,922,797	„	22,227,150	29,383,116	1,355,303
1902	320,061,196	116,551,439	„	23,483,969	29,700,970	1,483,620
1903	343,690,416	100,007,531	„	25,351,022	28,280,281	1,479,370
1904	349,551,616	100,285,999	„	25,671,851	28,314,995	1,413,206
1905	358,075,839	103,063,184	„	26,273,014	28,749,911	1,388,664
Totals	3,061,772,430	1,093,434,129		226,645,906	282,677,187	14,071,546

The weight of minerals conveyed by all British and Irish railway companies during the ten years, is thus shown to be nearly three times greater than the weight of general merchandise, but the receipts from general merchandise are one-fourth more than the receipts from minerals.

Coal, lime, and other kinds of merchandise of an analogous character, forming the fifth division of traffic and classed as minerals, are conveyed, mostly, from private sidings to stations or from private sidings to private sidings. In a few instances, they are conveyed from stations to stations.

Coal is the principal kind of merchandise included in minerals, and

furnishes a weight exceeding that of all other merchandise carried under this appellation. Cannel, culm, and slack are varieties of it. It is used for household purposes, and as fuel in the production of steam-power required for industrial processes; and not the least of its merits is the successful institution of railways, due, in a great measure, to the moderate cost of steam-power afforded by its use.

Coal is carried loose, and particles of it adhere to everything with which it comes in contact. The trucks employed to carry it become so unclean that they are rendered unfit to contain general merchandise. Most railway companies decline to provide trucks for the conveyance of coal and merchandise of a similar character. Consequently, coal proprietors and other traders whose mines and places of business are in proximity to the lines of these companies, furnish their own wagons. A few railway companies provide wagons to carry merchandise of this description.

Some kinds of merchandise that pertain to minerals, as, for example, pig iron, stones for paving and building purposes, and others that might be mentioned, are usually consigned in quantities that furnish full loads, and are carried in the railway companies' wagons built for the conveyance of general merchandise. The use of the vehicles is permitted because when the wagons have been discharged, after carrying such merchandise, and the floors have been swept, they are still fit to receive and carry general merchandise. Thus the cleanness of merchandise bestows advantages in relation to transport which railway companies recognize. With the exception of the services of portorage, all the services fulfilled in reference to general merchandise carried in open wagons are performed in regard to the kinds of merchandise mentioned when conveyed from stations to stations. Consequently, the rates and charges, omitting the charges for portorage, calculated for general merchandise forming the first division of traffic, will apply to minerals of the kind described when conveyed under the conditions stated.

A colliery, with a single shaft for winding purposes, yields a large quantity of coal, and where there are many pits the weight raised is very great, amounting, in some instances, to thousands of tons per week. The quantity being so immense, its disposal as it arrives at the pit's mouth is a matter of importance, because, if stocked, its cost is increased, which is undesirable with regard to a commodity that is plentiful, comparatively low in price, and in constant demand. Coal proprietors, therefore, sell in advance, so that when the trams, or small wagons containing the coal, emerge from the pits, they are immediately run on rails to certain places near, and tipped or overturned by means of suitable machinery, letting the coal fall into the truck, boat, or cart, as the case may be, appointed to receive it; a separate tipping-place being provided for each kind of receptacle. In this manner, coal is

dug, drawn from the mines, screened, and placed in vehicles ready for despatch, with the least expense.

A large portion of the total quantity of coal raised is conveyed by railway either to ports for shipment or to towns and other places for sale or consumption. The number of trucks required to carry it is very great, and to receive, load, and marshal the wagons, preparative to despatch, each colliery owner must acquire land for the purpose of constructing sidings thereon, to be connected, by means of a junction, with a neighbouring railway. In some instances, the railway is a considerable distance from the coal-field, necessitating the formation of a branch railway at the expense of the coal proprietors interested, with junctions connecting it with the sidings of collieries on the route. Locomotives or other power have to be provided to move the wagons from place to place, as may be requisite. The vicinity of the mouth of a coal-mine often resembles a station, and the operations of loading, shunting, and marshalling wagons, take place as at stations; the only kind of merchandise dealt with being coal. Pitwood, wire ropes, and stores, occasionally arrive by railway, but such traffic forms only an insignificant part of the whole.

Traders buy and sell coal either as merchants on their own account or as agents on behalf of others. They purchase or hire wagons, and have their names, and the names of the stations at which they transact business, conspicuously painted on the sides. These individuals buy coal from the colliery proprietors by contract or otherwise, as is found most profitable, and their wagons are despatched to the collieries to be loaded. Hence, in the sidings of many collieries are to be found trucks belonging to the coal-masters themselves, and trucks appertaining to coal agents and other traders; each truck bearing the name of the owner in large capitals.

The sidings of collieries are a part of the machinery by means of which coal proprietors prosecute their business, the land, the lines of rails, and, in many instances, the trucks, being their property. They also provide the power and labour requisite to move, load, and marshal the wagons. The premises are adjacent to the railway, the sidings being connected with it by junctions, but, in all other respects, are deemed to be as much apart from it as the premises of other traders. Trains stop at the junctions to leave empty wagons and to take away those that are loaded; the whole of the duties performed by the railway company's servants, in relation to the sidings, being comprised in these two acts.

It is the duty of the owners of private sidings to make suitable provision for the reception of empty wagons prior to their arrival. They are also expected to place in station order, having regard to their destinations, the loaded wagons that have to be despatched. The sidings at which empty wagons are detached from, and loaded

wagons attached to, the appointed trains, ought to be close to the railway. These conditions are necessary in order that the time expended in stopping to detach and attach wagons may be reasonably short; for if the sidings be too distant from the junction, or defective in accommodation, or if the placing of loaded wagons in readiness for removal be faulty, with the result of occasioning longer stoppages of trains than would otherwise be necessary, the cost will be increased and a corresponding increase of charges for stoppage rendered needful. In executing a service of stoppage, any labour required beyond that of the staff in charge of the train must be furnished by the owners of the sidings.

Coal is always carried in full loads; wagons being built specially for its conveyance, and used exclusively for the purpose. It is reasonable to suppose, therefore, that the load carried in each truck has, invariably, a weight equal to, or nearly equal to, the weight of load which the wagon is registered to carry.

If a truck weighing four tons can be built so as to carry a load of eight tons, one weighing five tons should be built so as to carry a load of ten tons, and so with trucks of other weights; the weight of truck proportionate to unit-weight of load being the same in each instance. Were it not so, and the weights of trucks proportionate to unit-weights of loads varied materially, owing to diversities in the build of trucks or other cause, differences of cost, and, consequently, of rates and charges, would ensue. Coal wagons, especially those belonging to traders, differ in size, weight, and carrying power, and it is a matter of importance to know if the different makes afford equal advantages in fulfilling the purpose for which they are intended.

After discharge, wagons that have contained coal are usually returned to the collieries whence they came, to be refilled and again forwarded. Each truck has to make a double journey in order to convey a load, and, therefore, twice the weight of the wagon carrying the load has to be taken into account in calculating the cost of conveyance.

On many railways, coal forms so large a part of the traffic that it is found expedient to deal with it separately from other kinds of merchandise; locomotives and staffs of men being appointed to convey it exclusively. There are ordinary coal trains that run daily and are entered in the time-tables with other trains for the guidance of railway officials and traders concerned. There are, also, special coal trains that run only as required; the journeys not being announced or foreshown. Nevertheless, it is not always convenient to convey coal apart from other traffic, and there are occasions when trains consist of wagons containing all kinds of merchandise, including coal.

Coal is found in so many districts and is used so generally that its conveyance by railway implies stoppages of trains at most goods

stations. Towns and villages have to be served, and trains of loaded coal-wagons respectively intended for single stations, and other trains timed, to stop at many stations during the course of each journey, have to be despatched in order to supply the various wants of traders. The service of stoppage to attach and detach trucks that contain, or have contained, coal, is probably as varied, with regard to the number and weight of trucks transferred at each stop, as the same service performed in relation to general merchandise. Although it might be found, on investigation, that the average weight and speed of coal trains, the average period of stoppage, and the average weight of loaded and empty wagons transferred at each stop, differed from the corresponding averages computed in reference to general merchandise, it is unadvisable, for reasons that have already been stated when dealing with general merchandise, to dissociate the conveyance of one kind of traffic from that of another, but that all merchandise, conveyed by one railway company only, should be joined together in the computation of the averages mentioned.

At many stations, particularly those in towns, coal is received in such large quantities that it is judged expedient to deal with it apart from other kinds of traffic. Accordingly, as the loaded wagons arrive they are placed in sidings specially provided for them. To facilitate their discharge, paved roads are constructed along the sidings, giving to road vehicles convenient access to the wagons standing in them. Coal is shovelled out of the trucks into carts, after which the loaded carts are weighed, and the coal is conveyed, loose, to its destination. Or, it is shovelled into bags and weighed, after which the bags of coal are hawked, in wagons, or, if already sold, conveyed to the premises of the buyer.

Trucks containing coal are discharged irregularly in point of time. After arrival at stations, one, two, three, and, in some instances, even more days elapse before the wagons are unloaded. Doubtless, there are many causes to account for delays. Traders undertake the task of discharging trucks loaded with coal, and the duty of the railway company is to place the wagons in convenient positions for the purpose. After discharge, the empty trucks are drawn out of the sidings, periodically, to be despatched to the collieries, and the process of shunting involves the haulage of loaded wagons that may be inter-placed with them. Expense is occasioned during the time that wagons, loaded or empty, remain at stations, therefore, their discharge or removal should be expedited as much as possible.

Let it be assumed that each kind of merchandise comprised in the fifth division of traffic is conveyed from private sidings to stations in wagons provided by the railway company, specially built and exclusively used for the purpose, and let the symbols  $E_1-PS_1$ , be employed to

signify that such merchandise is conveyed by one railway company only, under the conditions stated.

Let it be supposed that the greatest weight of load which a specially-built wagon may carry is twice the weight of the wagon itself.

Let it be assumed that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, is the same as of 1 to 1, or that the weight of each wagon carrying a load requires to be doubled in order to include the conveyance of empties.

On the grounds supposed, when a specially-constructed wagon carries its greatest weight of load, and the weight of the wagon has been doubled to include the conveyance of empties, the weight of wagon proportionate to unit-weight of load will be one ton, corresponding to grade 9.

When a railway company provides wagons for the conveyance of coal, an opportunity is afforded to build trucks of uniform size, not differing very much in weight, each registered to carry the same weight of load. If it be assumed that a railway company provides wagons of one size only for the conveyance of coal, each registered to carry the same weight of load, it becomes necessary to compute an average weight of wagon, and, after doubling it to include the conveyance of empties, to join it with the greatest weight of load which the wagons are individually registered to carry, to distinguish a grade. In that case, a load having this weight should be furnished at each time of loading. Coal-masters employ men to fill wagons with coal, and the duty of furnishing loads of the right magnitude rests with them.

If it be assumed that a railway company provides wagons of two sizes for the conveyance of coal, registered to carry two different weights of loads, it becomes requisite to compute two average weights of wagons, and, after doubling them to include the conveyance of empties, to join them, respectively, with the greatest weights of loads which the wagons are individually registered to carry, and the same grade should be appropriate for both. In that event, two different weights of loads, each being a maximum weight of load, would have to be provided for the two sizes of wagons at each time of loading.

It is doubtful if railway companies are aware of the importance of these matters, and if sufficient attention is given to size, weight, and strength, in the construction of wagons designed to carry coal. It is also questionable whether the men employed by traders to fill wagons with coal make sure that the load has the right magnitude in every instance. A deficiency of load, even if amounting only to a few cwts, increases the cost of conveyance and terminal services, per ton of load, and should be specially guarded against, considering the immense number of wagons that are loaded with coal every working-day.

If wagons, built to carry coal or any other kind of merchandise of a like character, have various sizes, their individual weights should be ascertained with a view of separating the weights obtained into groups, as may be deemed necessary, and calculating the average weight of wagon from the number of weights and wagons forming each group. When this duty has been performed, the weights of loads to be employed to distinguish each grade must be computed so that when joined, respectively, with the average weights of wagons, arrived at in the manner indicated, after providing for the conveyance of empties, their relative magnitudes will agree, or nearly agree, with the relative magnitudes of the weights of loads and wagons employed to distinguish the same grade in reference to other divisions of traffic.

With the object of securing full loads for wagons on every occasion, the weight of each truck and the weight of load which it carries should be stated in the consignment note or declaration, as it is usually called, and also in the invoice, so that clerks employed at the second as well as at the first terminal station may have an opportunity of comparing them and verifying the rate and charges appropriate thereto. No wagon ought to bear a load having a greater weight than that which it is built to carry, because of the danger that would be incurred by overloading. If the weight of coal or other kind of merchandise forming a load correspond with the weight of load which the truck is registered to carry, the maximum power of the wagon is utilized, and the rate and charges calculated for the grade that may be indicated, after providing for the conveyance of the empty wagon, will apply. The grade thus denoted may be taken to be the initial grade of the Table. If the weight of load be less than the maximum weight of load which the wagon is registered to carry, a higher grade will be indicated, after providing for the conveyance of the empty wagon, and the rate and charges for such grade will apply—with the proviso that a larger amount must not be charged for a less load than for a greater.

The adaptation of wagons to loads is a matter of importance, and concerns traders as much as railway companies. It is to the interest of both parties that wagons should be built to receive and carry loads of the greatest magnitude possible, and that measures should be taken to ensure the provision of loads of the right magnitude every time the wagons are loaded. Many wagons of coal may be consigned at one time to one individual, and, if of different sizes, the vehicles may be expected to have different weights. Unless the weight of load and weight of wagon in which it is carried be compared, systematically, instances of short-loading will be liable to pass undetected, involving loss to the railway company.

Although the procedure will add, considerably, to clerical labour, it is clear that the only effectual means of preventing loss arising from the



insufficient loading of wagons is to enter the weights of wagons in conjunction with the weights of loads separately in the invoices, and to approximate those that fall short of maximum loads to grades that are suitable, in order that the rates and charges may equitably apply in each case. Doubtless, difficulties will attend the introduction of this method of arriving at appropriate rates and charges, but they will not be insurmountable; and when traders perceive the justification for the measure and the benefit which they will obtain from it by the due observance of reasonable conditions, they may be trusted to agree to the regulations that it will be necessary to make.

When coal is conveyed from private sidings to stations in trucks provided by the railway company, the following services continue to be performed by the railway company:—

The first and second terminal services of stoppage.

A portion of the first and the whole of the second terminal service of railage.

A portion of the first and the whole of the second terminal service of haulage.

The first and second terminal services of truckage.

The junctional services of stoppage, railage, haulage, and truckage.

The remaining services, which are fulfilled by traders, are as follows:—

A portion of the first terminal service of railage.

A portion of the first terminal service of haulage.

To show how this comes to pass it will be convenient to commence at the period when coal wagons are discharged at stations, and the first terminal services begin. The trucks, being empty, are required at the collieries to be again loaded. Probably, at the time of discharge, they are hemmed in by loaded trucks, and remain waiting until some of these also are discharged. At appointed times—perhaps, once or twice a day—shunting takes place, the empty wagons being collected from the various sidings and placed in position for departure. Since all belong to the railway company, no marshalling is required. Having only one owner, and being designed for general use in the conveyance of coal, the trucks are available for any colliery, and may be transferred at private sidings readily, according to daily needs. The services of railage, haulage, and truckage, rendered by the railway company in relation to empty wagons at second terminal stations, pertain to the first terminal services, but in calculating the charges it is expedient to join them to the charges for the second terminal services of the same denomination. After the empty trucks have been conveyed to private sidings, the colliery owners take possession of them, and employ men and power to move them into

positions to be loaded as opportunity offers. When loaded, the trucks are marshalled and placed in sidings near to the railway, where they wait until, by the agency of the appointed trains, the railway company again receives them. Thus the colliery owners fulfil the remaining portions of the first terminal services of railage and haulage, while the railway company renders the remaining portion of the first terminal service of truckage. On the arrival of the loaded trucks at stations, the second terminal services of railage, haulage, and truckage, commence and continue, being performed by the railway company, until the trucks are discharged and the round of duties again begins. Identical services are fulfilled by the railway company in relation to other kinds of merchandise in this division of traffic, carried under the same conditions.

Let it be assumed that the average periods of time required to fulfil the first terminal services of railage, haulage, and truckage, in reference to coal, lime, etc., correspond with those supposed to be needed in relation to general merchandise, namely, that when trucks are discharged at stations, one day is required to shunt, place them in position, and despatch them, and that when they arrive at private sidings, half a day is necessary to move them into position to be loaded, and, when loaded, half a day is needed to marshal, place, and despatch them. Of these services, those rendered by the railway company are railage, haulage, and truckage, during a period of one day in relation to empty trucks at the stations where they are discharged, and the service of truckage during a period of one day—half the time in relation to empty trucks and half to loaded trucks—at the private sidings where they are loaded.

Let it be supposed that the maximum length of time that trucks of coal, lime, etc., after arrival at stations, are allowed to remain, for the convenience of traders, before they are unloaded, is three days, and that the average period of time during which they remain before they are discharged, taking all wagons into account, is two days. These times correspond with those assumed to subsist in relation to wagons loaded with general merchandise. On this basis, the second terminal services of railage, haulage, and truckage, relating to trucks loaded with coal, lime, etc., are rendered by the railway company during a period of two days.

Only two sizes and weights of wagons, joined with appropriate weights of loads, will be made use of for illustration, though other weights of wagons joined with other weights of loads, having the same relative magnitudes, respectively, might be added if it were necessary.

Let it be assumed that wagons of two sizes are specially built to carry coal and exclusively employed for the purpose, one size of wagon averagely weighing  $4\frac{1}{2}$  tons, and the other, 4 tons, the former registered to carry 9 tons, and the latter, 8 tons. Wagons specially built to carry any kind of merchandise and conveyed under the same conditions as

coal, might have the same weights, namely,  $4\frac{1}{2}$  tons and 4 tons, but the weights of maximum loads obtainable might not be so great as those furnished by coal.

Inasmuch as each kind of merchandise in this division of traffic is supposed to be consigned in full loads, fewer grades will be required than for some other divisions of traffic. But provision needs to be made for such kinds of merchandise as have different specific gravities. Coke, for example, has a less specific gravity than coal, and fully loaded wagons of it may be expected to pertain to a higher grade than fully loaded wagons of coal. To provide for the various weights of maximum loads furnished by different kinds of merchandise, as well as for loads that fall short of maximum loads, whether due to inadvertence, negligence, or other cause, an adequate number of grades should be assigned to the fifth division of traffic.

For the guidance of invoice clerks and others in the fulfilment of their duties, and for the information of traders, the No. of the appropriate grade for full loads should be stated opposite the name of each kind of merchandise comprised in the fifth division of traffic, together with any other knowledge that may be deemed essential.

Let ten grades, Nos. 9 to 18, be assigned to the fifth division of traffic, and let the weights of loads chosen to distinguish the grades and to be joined, respectively, with the average weights of the two sizes of wagons, doubled to include the conveyance of empties, be as follows —

*Merchandise consisting of coal, lime, etc., forming the fifth division of traffic, each kind being carried in wagons specially built and exclusively used for the purpose*

Nos of Grades	Distinguishing weights of load, to be joined, individually, with 9 tons, or twice the weight of a wagon weighing $4\frac{1}{2}$ tons				Successive decreases of weight			Nos of Grades	Distinguishing weights of loads to be joined, individually, with 8 tons, or twice the weight of a wagon weighing 4 tons				Successive decreases of weight		
	Tons	Tons	cwts	qrs	Tons	cwts	qrs		Tons	Tons	cwts	qrs	Tons	cwts	qrs
9	9	or	9	0	0			9	8	or	8	0	0		
10	$8\frac{7}{8}$	"	8	3	2	0	16	2	10	$7\frac{11}{16}$	"	7	5	2	0
11	$7\frac{1}{2}$	"	7	10	0	0	13	2	11	$6\frac{1}{2}$	"	6	13	0	0
12	$6\frac{3}{4}$	"	6	15	0	0	15	0	12	6	"	6	0	0	0
13	$6\frac{1}{8}$	"	6	2	2	0	12	2	13	$5\frac{9}{16}$	"	5	9	0	0
14	$5\frac{1}{2}$	"	5	10	0	0	12	2	14	$4\frac{1}{2}$	"	4	18	0	0
15	5	"	5	0	0	0	10	0	15	$4\frac{1}{8}$	"	4	9	0	0
16	$4\frac{1}{2}$	"	4	10	0	0	10	0	16	4	"	4	0	0	0
17	$4\frac{1}{8}$	"	4	2	0	0	8	0	17	$3\frac{1}{2}$	"	3	13	0	0
18	$3\frac{1}{4}$	"	3	15	0	0	7	0	18	$3\frac{1}{8}$	"	3	7	0	0

The service of portorage, relating to merchandise in the fifth division of traffic, is not performed by railway companies.

The first terminal service of clerkage, relating to merchandise forwarded from a private siding, is usually performed by the staff of clerks at the station nearest to the siding, and the respective staffs of clerks at the receiving stations perform the second terminal service. Invoices

have to be written, accounts collected, returns made, and other clerical duties executed. Occasionally, loaded wagons have to be weighed for the purpose of verifying the weights of the contents. The dues on coal, or the amounts chargeable for its transport, are, customarily, paid by the senders, the colliery proprietors. Uniformity in this respect simplifies the keeping of accounts, and tends to diminish the cost of clerkage. The provision of full loads, and the frequency of large single consignments, also contribute to lessen the expense of this service, so that, on the whole, the cost of book-keeping, performed with regard to coal, will not be so much, per ton, as when performed with respect to general merchandise. It has, however, been shown that a change in the practice of invoicing coal is needful, and that, in addition to the Nos of the wagons, which are usually given, the separate weights of the wagons and the loads which they carry should also be entered in the invoices for the purpose of comparison and approximation, with the ulterior object of insuring the provision of loads of the greatest magnitude in all cases. If this procedure be adopted, it will add to expense. Partly, therefore, because the proposed change will have the effect of increasing the cost of clerkage, and partly to simplify as much as possible the work of illustration, the charges for the first and second terminal services of clerkage, calculated for general merchandise, shall be deemed suitable for merchandise in the fifth division of traffic.

The chance of damage occurring to coal, lime, etc, during transit, or while remaining at junctions or terminal stations, is inconsiderable. Collisions sometimes result in spilling the contents of trucks, and a portion may be lost. Also, improper loading, or the heaping of loads so that they are higher than the sides of the trucks, may be the occasion of loss of coal in transit through ordinary concussion or vibration. Doubtless, the amount annually paid by railway companies for loss of, or damage to, merchandise in the fifth division of traffic is very small. For the purpose of illustration, however, it has been judged expedient to assume that the risk attending the transport of merchandise is the same for each division of traffic, and the charges have been computed on that basis. Consequently, the charges for risk calculated in reference to general merchandise must apply to merchandise in every other division of traffic. The possibility of damage occurring to locomotives and wagons in the course of transit and during their stay at junctions and terminal stations is as great for one kind of traffic as for another, and, therefore, the charges for risk already computed with respect to wagons carrying general merchandise must apply with regard to wagons carrying merchandise in the fifth division of traffic.

The charges for extraneous services, calculated in reference to general merchandise, will equitably apply to merchandise in the fifth division of traffic.

As stated before, it is undesirable to repeat Examples if the factors to be made use of are identical. Therefore, with reference to grades 9 to 18, inclusive, the scales of rates and the consecutive distances to which they apply, and the charges for services, liabilities, and obligations, mentioned below, calculated for general merchandise and forming a part of the illustrative Examples, will be appropriate for merchandise in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by the railway company, as follows :—

Scales of rates, including taxes, embracing grades 9 to 18, and the consecutive distances to which they are to apply.	} As in Example 11.
Charges for the first and second terminal services of stoppage, including taxes.	} As in Example 2
Charges for the junctional services of stoppage, railage, haulage, and truckage, including taxes.	} As in Example 6.
Charges for the first and second terminal services of clerkage.	} As in Example 8.
Charges for risk . . . . .	As in Example 9.
Charges for extraneous services . . . . .	As in Example 9.

As previously stated, at private sidings, whence coal, lime, etc., are despatched, portions of the first terminal services of railage and haulage are fulfilled by traders, the remaining portions being performed by the railway company at the second terminal stations. Charges for these two services, after the weights of wagons have been doubled to include the conveyance of empties, have already been calculated in relation to articles of extraordinary weight or dimensions, and separately shown in previous Examples; each terminal station being credited with the services performed thereat. The calculation of charges for the respective services performed at each terminal station renders it easy to distinguish those to which the railway company is entitled from those to which it is not entitled when a private siding is substituted for a station, the conditions being otherwise the same. Hence, the charges for the second terminal services of railage and haulage and for those portions of the first terminal services of railage and haulage which are performed at second terminal stations, calculated in reference to articles of extraordinary weight or dimensions forming the third division of traffic, will fitly apply, so far as concerns grades 9 to 18, to merchandise in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by the railway company.

Charges for the first and second terminal services of truckage, after the weights of wagons have been doubled to include the conveyance of empties, have already been calculated in reference to articles of extraordinary weight or dimensions; and those relating to grades 9 to 18

will fitly apply to merchandise in the fifth division of traffic, carried in wagons provided by the railway company under the conditions stated.

To sum up, charges for the second terminal services of railage and haulage, and for those portions of the first terminal services of railage and haulage which are performed at second terminal stations, together with charges for the first and second terminal services of truckage, which have been calculated in reference to merchandise in the third division of traffic, will appropriately apply, so far as regards grades 9 to 18, to merchandise in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by the railway company as follows —

Charges for the second terminal service of railage and for that portion of the first terminal service of railage which is rendered at second terminal stations.	} As in Example 17
Charges for the second terminal service of haulage and for that portion of the first terminal service of haulage which is performed at second terminal stations	
Charges for the first and second terminal services of truckage	} As in Example 19

Special services relating to coal are frequently rendered by railway companies at terminal stations. At ports where coal is shipped, machinery is often provided for discharging the trucks by canting them, and allowing the contents to fall directly into barges or into the holds of vessels set to receive them. Also, in connection with some stations, if the circumstances permit, places for storing coal are let to traders. The cost of special services of any kind regularly or occasionally rendered should be carefully calculated and charged for equally with ordinary services.

The weight of coal conveyed is so immense, and the amount periodically paid by individual traders for its transport is so great, that it may be found advisable to establish rates and charges, per ton of load, for each mile or other initial distance, without altering the rate of progression; thus employing the scales of rates in unbroken succession. Also, in adding rates to charges, especially with regard to short distances, it may be deemed expedient to divide fractions of a penny into farthings; each fraction of a farthing, however small, being called a farthing. In that event, the united rates and charges would be stated in shillings, pence, and farthings. No objection can be made to these modes of procedure because they do not infringe the principle of equity. There is, however, no occasion to alter the form of the Table now to be prepared for coal and other merchandise in the fifth division of traffic,

*Coal, lime, etc., carried in wagons provided by the railway company—Charges for terminal and junctional services, liabilities, and obligations.*

[illegible]

seeing that the object is that of illustration only; and, therefore, the course previously followed will be continued.

A complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to coal, lime, and analogous kinds of merchandise, carried under specified conditions, is given in Example 25, the first of the two preceding Examples (see p 239). The charges have been calculated and already made use of in relation to other divisions of traffic. Reference to the No. of Example whence the charges have been taken is entered opposite the name of each kind of service, liability, and obligation.

Example 26 (pp. 240-245) forms a complete Table (Table IV.) of Rates and Charges, per ton of load, for merchandise comprised in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by the railway company. It is prepared by adding the rates for consecutive distances calculated for grades 9 to 18, inclusive, contained in Example 11, to the total charges contained in Example 25, to form scales of united rates and charges, stated in shillings and pence, together with the consecutive distances, embracing 1 to 200 miles, to which they apply. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence. The consecutive distances correspond with those adopted for general merchandise; the rate of progression being increased, after 15 miles, from 1 to 2 miles, and after 65 miles, from 2 to 3 miles.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be computed and entered in the manner shown in the Example.

The amounts due for the transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will assist clerks to avoid entering wrong amounts in invoices when the circumstances are as described, and will save the labour of calculation with regard to consignments whose weights correspond with the weights of loads employed to distinguish the grades.



## CHAPTER XV

### SOUTH NORTHERN RAILWAY COMPANY

#### COAL, LIME, ETC, CARRIED IN WAGONS PROVIDED BY TRADERS

IF it were the practice for every trader, extensively engaged in one or more branches of business, to provide wagons for the transport of his own merchandise, the interterminal and terminal services of railage and haulage, fulfilled by railway companies, would be greatly increased. The limitation of the use of wagons to the traders' own goods would, undoubtedly, add to the weight of returned empties, since it cannot be expected that loads could be provided for each journey, out and in. Even under the favourable conditions existing, wagons, having one owner, and available to receive general merchandise at every station on the parent railway, cannot always be provided with loads at the stations where they are discharged; some having to be conveyed to other stations that are in need of empty wagons. By multiplying the number of owners, the restriction in the use of wagons would not only augment the weight of returned empties, but would have the further effect of increasing the service of haulage at terminal stations, because the empty wagons, having different destinations, would have to be placed in station order, before departure.

When traders provide trucks to carry coal, no additional cost of conveyance is occasioned by the action, because all coal trucks, whether owned by the railway company or by traders, are, except in special circumstances, returned empty to the collieries, but the duty of separately collecting together, and placing in due order, empty wagons that have to be conveyed to different collieries, increases the amount of shunting, and adds, considerably, to the cost of the terminal service of haulage. Hence, the first terminal service of haulage, performed in relation to traders' empty wagons at second terminal stations—whether the wagons have contained coal or any other kind of merchandise—involves the duty of marshalling, which is an extra duty, and it would be justifiable to add something on account of it to the sum employed to compute charges for the service. Let it be sufficient to note the circumstance without proceeding to alter the sum that has already been made use of, and, for the sake of simplicity of illustration, let the

seeing that the object is that of illustration only ; and, therefore, the course previously followed will be continued.

A complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to coal, lime, and analogous kinds of merchandise, carried under specified conditions, is given in Example 25, the first of the two preceding Examples (see p 239) The charges have been calculated and already made use of in relation to other divisions of traffic. Reference to the No. of Example whence the charges have been taken is entered opposite the name of each kind of service, liability, and obligation.

Example 26 (pp. 240-245) forms a complete Table (Table IV.) of Rates and Charges, per ton of load, for merchandise comprised in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by the railway company. It is prepared by adding the rates for consecutive distances calculated for grades 9 to 18, inclusive, contained in Example 11, to the total charges contained in Example 25, to form scales of united rates and charges, stated in shillings and pence, together with the consecutive distances, embracing 1 to 200 miles, to which they apply Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence. The consecutive distances correspond with those adopted for general merchandise ; the rate of progression being increased, after 15 miles, from 1 to 2 miles, and after 65 miles, from 2 to 3 miles.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be computed and entered in the manner shown in the Example.

The amounts due for the transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will assist clerks to avoid entering wrong amounts in invoices when the circumstances are as described, and will save the labour of calculation with regard to consignments whose weights correspond with the weights of loads employed to distinguish the grades.

## CHAPTER XV

### SOUTH NORTHERN RAILWAY COMPANY

#### COAL, LIME, ETC., CARRIED IN WAGONS PROVIDED BY TRADERS

If it were the practice for every trader, extensively engaged in one or more branches of business, to provide wagons for the transport of his own merchandise, the interterminal and terminal services of railage and haulage, fulfilled by railway companies, would be greatly increased. The limitation of the use of wagons to the traders' own goods would, undoubtedly, add to the weight of returned empties, since it cannot be expected that loads could be provided for each journey, out and in. Even under the favourable conditions existing, wagons, having one owner, and available to receive general merchandise at every station on the parent railway, cannot always be provided with loads at the stations where they are discharged; some having to be conveyed to other stations that are in need of empty wagons. By multiplying the number of owners, the restriction in the use of wagons would not only augment the weight of returned empties, but would have the further effect of increasing the service of haulage at terminal stations, because the empty wagons, having different destinations, would have to be placed in station order, before departure.

When traders provide trucks to carry coal, no additional cost of conveyance is occasioned by the action, because all coal trucks, whether owned by the railway company or by traders, are, except in special circumstances, returned empty to the collieries, but the duty of separately collecting together, and placing in due order, empty wagons that have to be conveyed to different collieries, increases the amount of shunting, and adds, considerably, to the cost of the terminal service of haulage. Hence, the first terminal service of haulage, performed in relation to traders' empty wagons at second terminal stations—whether the wagons have contained coal or any other kind of merchandise—involves the duty of marshalling, which is an extra duty, and it would be justifiable to add something on account of it to the sum employed to compute charges for the service. Let it be sufficient to note the circumstance without proceeding to alter the sum that has already been made use of, and, for the sake of simplicity of illustration, let the

charges already computed for the first terminal service of haulage, performed at second terminal stations, applicable to merchandise in the fifth division of traffic when carried in wagons provided by the railway company, apply also to the same description of merchandise when carried in traders' wagons

Most railway companies, even those whose lines serve important mining districts from which they derive a large portion of traffic, decline to provide wagons for the purpose of carrying coal and other kinds of merchandise that foul the vehicles in which they are conveyed. In these circumstances, the wagons have to be furnished by traders.

In view of the variety of makes and sizes of vehicles constructed, and presuming that no steps are taken by railway companies to see that wagons of approved size, weight, and strength, designed to carry one kind of merchandise only, are provided by traders, it is reasonable to infer that traders' wagons do not always afford equal advantages in fulfilling the purpose for which they are intended. It is probable that the inequalities are so great that identical weights of loads obtained from one kind of merchandise, conveyed between the same places, will approximate to different grades, and, consequently, that different rates and charges, per ton of load, should, in justice, be employed to compute the dues for transport. By the present practice, the sum, per ton of load, representing the rate and charges for coal, lime, or other article in the fifth division of traffic, conveyed from a private siding to a station, applies to each consignment irrespective of the relation which the weight of wagon bears to the weight of load which it carries. Consequently, traders have no inducement to bestow the attention that is needful in providing wagons of the most suitable kind for each description of merchandise. But by altering the conditions so that the rates and charges, per ton of load, shall be lower or higher in accordance with the greater or less economic adaptation of wagons to loads, having regard to the respective relative magnitudes of their weights, traders will have an incentive to supply wagons of the most approved pattern, and to take such measures as will ensure the provision of loads of sufficient magnitude.

Let it be assumed that each kind of merchandise in the fifth division of traffic is conveyed from private sidings to stations in wagons provided by traders, specially built and exclusively used for the purpose, and let the symbols, *EI—PSI—TW*, be employed to signify that such merchandise is conveyed by one railway company only, under the conditions stated.

To save repetition, let it be supposed that the conditions specified in the last chapter, presumed to exist with regard to merchandise in the fifth division of traffic, still continue, except that wagons are provided by traders instead of by the railway company. In the altered circumstances,

the interterminal, terminal, and junctional services of truckage, relating to loads and wagons, are rendered by traders, and, of course, cease to be fulfilled by the railway company. Consequently, all charges for the services of truckage, relating to loads and wagons, included in the last Table of Rates and Charges (Ex. 26), applicable to merchandise in the fifth division of traffic when carried in wagons provided by the railway company, must be omitted in preparing a Table of Rates and Charges applicable to the same description of merchandise when carried in traders' wagons.

Let wagons of two sizes be again used for illustration, and let it be assumed that their average weights are  $4\frac{1}{2}$  tons and 4 tons, and that they are registered to carry 9 tons and 8 tons, respectively, as before, in order that the weights of loads employed to distinguish the grades in the last Table may again be made use of to mark the same grades in the Table next to be prepared. By this arrangement, comparison of the different rates and charges for the same description of merchandise, according as it is carried in wagons provided by the railway company and in wagons furnished by traders, will be facilitated.

The sums employed to compute the cost of the interterminal services of railage, haulage, and truckage, constituting conveyance, including taxes and profit, are, respectively,  $\cdot 08d$ ,  $10d$ , and  $02d$ , amounting to  $\cdot 20d$ , per ton per mile, reckoned on the whole weight of each train. It has been assumed that the ratio of the average weight of a locomotive and its accessories to the average weight of a train-load is the same as of 1 to 2. By increasing each sum by one-half, or to  $\cdot 12d$ ,  $\cdot 15d$ , and  $03d$ , respectively, the resulting amount,  $\cdot 30d$ , per ton per mile, applied to the weights of loads and wagons forming the train-load, includes the cost of conveying the instruments of power without their weights appearing in the process of calculation.

When wagons are provided by traders, the sum to be subtracted from the amount on account of the non-performance of the interterminal service of truckage is  $\cdot 02d$ , or one-fifteenth of  $\cdot 30d$ , per ton per mile. The remaining portion of the sum for truckage, namely,  $01d$  per ton per mile, must be retained for the purpose of computing the cost of the interterminal service of truckage still rendered in relation to locomotives and their accessories. The sum to be employed in the computation of rates for conveyance when traders provide wagons will, therefore, be  $28d$ , instead of  $30d$ , per ton of load and wagon, per mile, or fourteen-fifteenths of the amount. In place of decreasing the separate amounts in each scale of rates, which would be a tedious task, the same effect may be achieved by increasing, in a correspondingly needful degree, the consecutive distances to which the scales of rates apply. By expressing one mile as fifteen-fifteenths, and taking one from the denominator, it becomes fourteen-fourteenths, or  $1\frac{1}{14}$  miles. By substituting  $1\frac{1}{14}$  miles for 1 mile as the

initial distance, and by adding  $1\frac{1}{4}$  miles, or a multiple of it, to form succeeding distances, the unaltered scales of rates may respectively apply to the changed consecutive distances, and the effect will be equivalent to the reduction of the sum, employed to compute the rates, from '30d. to '28d per ton of load and wagon, per mile.

Accordingly, with reference to merchandise in the fifth division of traffic when carried in traders' wagons, let the unaltered scales of rates apply to changed consecutive distances, resulting from the substitution of  $1\frac{1}{4}$  miles for 1 mile as the initial distance, which will have the effect of cancelling the amounts calculated for the interterminal service of truckage rendered in relation to loads and wagons, previously included in the rates per ton.

The service of stoppage, whether terminal or junctional, is a combination of the services of railage, haulage, and truckage, which, although performed in connection with the whole of a train, are specifically rendered on behalf of that part of the train-load which is transferred at each stop.

The sum employed to compute charges for each terminal service of stoppage is 1'200d. per ton of load and wagon. Of this sum, one-fifteenth, or '080d. is used to compute charges for the service of truckage rendered in relation to loads and wagons; and fourteen-fifteenths, or 1'120d., is employed to compute charges for the services of railage and haulage performed in relation to loads and wagons, including the instruments of power, and the service of truckage rendered in reference to the instruments of power only.

The junctional services of stoppage are performed in relation to a part of all kinds of traffic, but it has been judged expedient to apportion the cost, so that all merchandise in each division of traffic shall be subject to charges for two junctional services of stoppage, and the sum '480d., per ton of load and wagon, employed to compute them, has been chosen with that object. Of this sum, one-fifteenth, or 0'32d., is employed to compute charges for the service of truckage rendered in relation to loads and wagons; and fourteen-fifteenths, or '448d., is used to compute charges for the services of railage and haulage performed in reference to loads and wagons, including the instruments of power, and the service of truckage rendered in relation to the instruments of power only.

When wagons are provided by traders, charges for the first and second terminal services of stoppage and for two junctional services of stoppage require to be calculated anew, in order that they may relate only to the services performed by the railway company.

Accordingly, let 1'120d. per ton of load and wagon, including taxes and profit, be employed to compute charges for each terminal service of stoppage; and let 448d. per ton of load and wagon, including taxes and profit, be employed to compute charges for two junctional services of

## SOUTH NORTHERN RAILWAY COMPANY

*Coal, lime, etc., carried in wagons provided by traders—Charges for the first and second terminal services of stoppage and for two junctional services of stoppage.*

Nos OF GRADES														
	9	10	11	12	13	14	15	16	17	18				
<b>Er-PSI-TW.</b> Distinguishing weights of loads . . . . (1)	Tons 9	Tons 8 1/2	Tons 7 1/2	Tons 6 1/2	Tons 6 1/8	Tons 5 3/4	Tons 5	Tons 4 3/4	Tons 4 1/2	Tons 3 1/2				
Average weights of wagons (4 1/2 tons + 4 1/2 tons for empties)	9	9	9	9	9	9	9	9	9	9				
<b>Er-PSI-TW.</b> Distinguishing weights of loads . . . . (2)	8	7 1/2	6 1/2	6	5 1/2	4 1/2	4 1/8	4	3 1/2	3 1/8				
Average weights of wagons (4 tons + 4 tons for empties)	8	8	8	8	8	8	8	8	8	8				
Unit-weights of loads . . . .	1	1	1	1	1	1	1	1	1	1				
Proportionate weights of wagons	1	1 1/2	1 3/4	1 1/2	1 1/4	1 1/8	1 1/4	2	2 1/2	2 1/2				
Totals . . . .	2	2 1/2	2 1/2	2 1/2	2 1/4	2 1/8	2 1/4	3	3 1/2	3 1/2				
Charges for the 1st terminal service of stoppage, computed at 1 120d per ton of load	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120	Per ton of load 1 120				
And at 1 120d per ton of wagon . . . .	1 120	1 232	1 344	1 493	1 642	1 829	2 016	2 240	2 464	2 688				
Total charges for the 1st terminal service of stoppage . . . .	2 240	2 352	2 464	2 613	2 762	2 949	3 136	3 360	3 584	3 808				
Charges for the 2nd terminal service of stoppage, computed at 1 120d per ton of load	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120	1 120				
And at 1 120d per ton of wagon . . . .	1 120	1 232	1 344	1 493	1 642	1 829	2 016	2 240	2 464	2 688				
Total charges for the 2nd terminal service of stoppage . . . .	2 240	2 352	2 464	2 613	2 762	2 949	3 136	3 360	3 584	3 808				
Total charges for the 1st and 2nd terminal services of stoppage, including taxes	4 480	4 704	4 928	5 226	5 524	5 898	6 272	6 720	7 168	7 616				
Charges for two junctional services of stoppage, computed at 448d per ton of load	448	448	448	448	448	448	448	448	448	448				
And at 448d per ton of wagon . . . .	448	492	537	597	657	731	806	896	985	1 075				
Total charges for two junctional services of stoppage, including taxes . . . .	896	940	985	1 045	1 105	1 179	1 254	1 344	1 433	1 523				

stoppage, performed in relation to merchandise in the fifth division of traffic, carried in wagons provided by traders.

Resulting from the employment of the sums named, charges for the first and second terminal services of stoppage, and for two junctional services of stoppage, performed in relation to merchandise in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by traders, are shown, separately, in Example 27 (p 251).

Charges calculated for the 1st and 2nd terminal services of truckage and for the junctional service of truckage, contained in previous Examples, refer wholly to loads and wagons, and, of course, cease to apply when wagons are provided by traders.

A complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to coal, lime, and analogous kinds of merchandise, carried under specified conditions, is given in Example 28, the first of the two Examples immediately following. Reference to the No of Example whence the charges have been taken is entered opposite the name of each kind of service, liability, and obligation

Example 29 forms a complete Table (Table V) of rates and charges, per ton of load, for merchandise comprised in the fifth division of traffic, conveyed from private sidings to stations in wagons provided by traders. It is prepared by adding the rates for consecutive distances calculated for grades 9 to 18, inclusive, contained in Example 11, to the total charges contained in Example 28, to form scales of united rates and charges, stated in shillings and pence. Fractions of a penny are disposed of—those under a half-penny being disregarded, and those amounting to a half-penny and over being treated as pence. The initial distance has been altered from 1 mile to  $1\frac{1}{4}$  miles. By adding  $1\frac{1}{4}$  miles, or a multiple of it, to form succeeding distances, a series of distances is obtained to which the unaltered scales of rates and charges apply in the same order as before. The application of the unaltered scales of rates to the changed consecutive distances has the effect of cancelling those portions of the rates which refer to the interterminal service of truckage rendered in relation to loads and wagons. The consecutive distances extend from  $1\frac{1}{4}$  to  $214\frac{1}{4}$  miles, and the rate of progression is increased, after  $16\frac{1}{4}$  miles, from  $1\frac{1}{4}$  to  $2\frac{3}{4}$  miles, and after  $69\frac{3}{4}$  miles, from  $2\frac{3}{4}$  to  $3\frac{3}{4}$  miles.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be computed and entered in the manner shown in the Example.



## SOUTH NORTHERN RAILWAY COMPANY

*Coal, lime, etc., carried in wagons provided by traders—Charges for terminal and junctional services, liabilities, and obligations*

Nos OF GRADES		9	10	11	12	13	14	15	16	17	18
E1-PS1-TW	Distinguishing weights of loads . . . . . (1)	Tons 9	Tons 8 $\frac{7}{8}$	Tons 7 $\frac{1}{2}$	Tons 6 $\frac{1}{2}$	Tons 6 $\frac{1}{2}$	Tons 5 $\frac{1}{2}$	Tons 5	Tons 4 $\frac{1}{2}$	Tons 4 $\frac{1}{2}$	Tons 3 $\frac{1}{2}$
	Average weights of wagons	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$
	Add the same weights of wagons to include the weight of empty wagons conveyed . . . . .	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$
	Total weights of wagons	9	9	9	9	9	9	9	9	9	9
E1-PS1-TW	Distinguishing weights of loads (2)	8	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6	5 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4	3 $\frac{1}{2}$	3 $\frac{1}{2}$
	Average weights of wagons	4	4	4	4	4	4	4	4	4	4
	Add the same weights of wagons to include the weight of empty wagons conveyed . . . . .	4	4	4	4	4	4	4	4	4	4
	Total weights of wagons . . . . .	8	8	8	8	8	8	8	8	8	8
	Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
	Proportionate weights of wagons . . . . .	1	1 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	2 $\frac{1}{2}$	2 $\frac{1}{2}$
	Totals . . . . .	2	2 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$
	Ref to the Nos of Ex-mples 27 17	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of
18	Charges for the 1st and 2nd terminal services of stopping, including taxes	4 480	4 704	4 928	5 226	5 524	5 868	6 272	6 720	7 168	7 616
	Charges for the 2nd terminal service of haulage and for that portion of the 1st terminal service of haulage which is rendered at 2nd terminal stations, including taxes	1 050	1 095	1 140	1 200	1 260	1 335	1 410	1 500	1 590	1 680
	Charges for the 2nd terminal service of haulage which is performed at 2nd terminal stations	2 100	2 190	2 280	2 400	2 520	2 670	2 820	3 000	3 180	3 360
	Charges for two junctional services of stopping, including taxes	806	940	985	1 045	1 105	1 179	1 254	1 344	1 433	1 523
27	Charges for the junctional services of stopping, including taxes	806	940	985	1 045	1 105	1 179	1 254	1 344	1 433	1 523
	Charges for the junctional service of haulage	120	126	132	140	148	158	168	180	192	204
	Charges for the 1st and 2nd terminal services of cleavage	3 000	3 150	3 300	3 500	3 700	3 950	4 200	4 500	4 800	5 100
	Charges for risk	300	312	324	340	356	376	400	420	444	468
6	Charges for extraneous services . . . . .	120	126	132	140	148	158	168	180	192	204
	Total charges for terminal and junctional services, liabilities, and obligations	12 126	12 706	13 287	14 061	14 835	15 803	16 772	17 934	19 095	20 257
	Ref to the Nos of Ex-mples 27 17	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of	Per ton of load of
	Charges for the 1st and 2nd terminal services of stopping, including taxes	4 480	4 704	4 928	5 226	5 524	5 868	6 272	6 720	7 168	7 616
8	Charges for the 2nd terminal service of haulage and for that portion of the 1st terminal service of haulage which is rendered at 2nd terminal stations, including taxes	1 050	1 095	1 140	1 200	1 260	1 335	1 410	1 500	1 590	1 680
	Charges for the 2nd terminal service of haulage which is performed at 2nd terminal stations	2 100	2 190	2 280	2 400	2 520	2 670	2 820	3 000	3 180	3 360
	Charges for two junctional services of stopping, including taxes	806	940	985	1 045	1 105	1 179	1 254	1 344	1 433	1 523
	Charges for the junctional services of stopping, including taxes	806	940	985	1 045	1 105	1 179	1 254	1 344	1 433	1 523
9	Charges for the junctional service of haulage	120	126	132	140	148	158	168	180	192	204
	Charges for the 1st and 2nd terminal services of cleavage	3 000	3 150	3 300	3 500	3 700	3 950	4 200	4 500	4 800	5 100
	Charges for risk	300	312	324	340	356	376	400	420	444	468
	Charges for extraneous services . . . . .	120	126	132	140	148	158	168	180	192	204

The amounts due for transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will aid clerks to avoid entering wrong amounts in invoices when the circumstances are as described, and will save the labour of calculation with regard to consignments whose weights correspond with the weights of loads employed to distinguish the grades.

Manufacturers of iron, steel, cotton, woollen, paper, chemicals, pottery, and other merchandise, as well as bleachers, printers, and dyers of fabrics, whose works are situated near a railway, often find it advantageous to acquire land, construct sidings, and connect them by means of junctions with the railway, for the purpose of receiving and forwarding wagons containing the different kinds of merchandise bought and sold, or consigned to them, in the prosecution of their respective businesses. Like colliery proprietors, these traders not only own the sidings, but provide the labour, machinery, and power, requisite to perform the various services associated with wagons, such as making provision for their reception, loading and unloading them, moving them from one position to another, placing them in due order for departure, and attending to the trains appointed to stop at the junctions.

The services that are performed at private sidings pertain to first or second terminal services, according as the traffic proceeds outward or inward. The raw materials received by traders differ for each kind of manufacture, but the article of coal is required as fuel in the production of steam-power at almost every place where the operations are accomplished by the aid of machinery. Thus coal is frequently conveyed from private sidings to private sidings, and is carried in traders' wagons or in wagons provided by the railway company, according to circumstances.

The two Tables of Rates and Charges, already furnished, applicable to merchandise in the fifth division of traffic, firstly, when carried in wagons provided by the railway company, and secondly, when carried in traders' wagons, will serve, without further exemplification, to point out the procedure to be followed in preparing Tables of Rates and Charges to apply to merchandise in any division of traffic, whether forwarded from, or received at, private sidings, and whether conveyed in wagons belonging to the railway company or to traders. All that is needful is to correctly separate the services performed by the railway company from those rendered by traders, in order that the charges for the respective services

fulfilled by the railway company may be duly calculated, and so that traders may not be debited with charges for services which they themselves perform.

Private sidings should be treated as stations in all respects, and loaded or empty wagons that have to be taken to those places should be labelled accordingly, or otherwise display destination, so that they may be conveyed uninterruptedly by trains appointed to stop at the sidings. The removal of wagons from private sidings should be similarly regulated with the object of securing unbroken transit to as great an extent as possible. By these means, journeys may be accomplished in the shortest time, and delivery and collection of wagons frequently effected at one stoppage—advantages that tend to lessen the cost of operations and the risk attending their performance.

## CHAPTER XVI

### SOUTH NORTHERN RAILWAY COMPANY

#### MERCHANDISE CARRIED IN TRADERS' WAGONS THAT WOULD OTHERWISE BE RETURNED EMPTY TO PRIVATE SIDINGS

A CONSIDERABLE quantity of timber, described as pit-wood, is used in coal-mines to prop the roof in places where coal is, or has been, dug. Some of it comes from foreign countries, and is shipped to ports situated nearest to the mines. On arrival at port-towns, it is sometimes found convenient to make use of trucks belonging to traders, that have carried coal, for the purpose of conveying the timber to its destination. Thus, instead of being returned empty, coal-wagons are occasionally provided with loads to be conveyed to the collieries. At inland stations, different kinds of merchandise are, occasionally, placed in traders' wagons that have carried coal or analogous merchandise, and conveyed to private sidings under the same conditions. The expense of returning the empty trucks is included in the rates and charges already calculated for coal, and, therefore, the rates and charges to which the railway company is entitled when timber and other kinds of merchandise are conveyed in the circumstances described, and which have now to be calculated, refer to the return-loads only.

Let it be supposed that merchandise of various kinds, includible in different divisions of traffic, is conveyed from stations to private sidings in wagons provided by traders, specially built to carry coal or other kind of merchandise, and which would else be returned empty to private sidings; and let the symbols  $Fr - IPS - TW$  be employed to denote that such merchandise, which shall be held to constitute the sixth division of traffic, is conveyed by one railway company only, under the conditions stated.

In the circumstances presumed, the interterminal, terminal, and junctional services of truckage, relating to loads and wagons, are, of course, wholly rendered by traders, who also fulfil the second terminal services of railage and haulage—the terminals being now reversed. The interterminal services of railage and haulage relating to return-loads and to the instruments of power, and the interterminal service of truckage relating to the instruments of power only, are fulfilled by the railway company.

To prevent misconception, let it be supposed that when traders' trucks that have carried coal or analogous merchandise are discharged at stations and have to be reloaded at the same stations, half-a-day is required to place them in position for loading, and, when loaded, half-a-day is needed to marshal, place, and despatch them. The time, one day, corresponds with the time deemed requisite to shunt and marshal empty wagons, place them in position, and despatch them from second terminal stations to private sidings—operations constituting those portions of the first terminal services of railage and haulage which are performed at second terminal stations, the cost of which has already been included in the charges for terminal services appropriate for coal and analogous merchandise (Ex. 28). Considered in reference to the wagons only, the services rendered in one case are equal in value to the services rendered in the other, and may be substituted for them. Consequently, it is proper to assume that the charges calculated for the terminal services named are already defrayed, and that the charges due to the railway company, and now to be calculated, have reference to the return-loads only.

With respect to loads provided for traders' trucks that have carried coal or analogous merchandise, conveyed from stations to private sidings, let it be assumed that the service of portorage at the places of loading is performed by traders. In the event of traders using the railway company's cranes in the operation of loading wagons, it would be necessary to charge for cramage.

The terminal and junctional services, liabilities, and obligations, relating to return-loads, exclusively, fulfilled or undertaken by the railway company in the circumstances described, are as follows:—

The first and second terminal services of stoppage, with taxes.

The first terminal service of railage, with taxes.

The first terminal service of haulage.

Two junctional services of stoppage, with taxes.

The junctional service of railage, with taxes

The junctional service of haulage.

The first and second terminal services of clerkage

Risk.

Extraneous services

The sum, per ton of load, employed in previous Examples to compute charges for each kind of service, liability, and obligation, mentioned above, now becomes the charge itself. One column, therefore, will suffice to contain the respective charges, per ton of load, due to the railway company.

Let it be assumed that any trader's wagon which has carried coal or

analogous merchandise may be used to carry a return load, provided it can be conveyed with safety.

A complete list of charges, per ton of load, for terminal and junctional services, liabilities, and obligations, applicable to return-loads, conveyed under the conditions stated, is furnished in the next Example; due reference being made to the Nos of Examples from which the sums forming the respective charges are taken

## EXAMPLE 30

## SOUTH NORTHERN RAILWAY COMPANY

*Merchandise carried in traders' wagons that would otherwise be returned, empty, to private sidings—Charges for terminal and junctional services, liabilities, and obligations*

Ft-IPS-TW		Weight of load	Any weight which a wagon may safely carry Any weight
		Weight of wagon	
Unit-weight of load			Ton I
Ref to the Nos of Examples		Per ton of load d	Per ton of load d
27	{ Charge for the 1st terminal service of stoppage, including taxes	I 120	2 240
	{ Charge for the 2nd terminal service of stoppage, including taxes	I 120	
3	Charge for the 1st terminal service of railage, including taxes	—	150
4	Charge for the 1st terminal service of haulage	—	300
27	{ Charge for two junctional services of stoppage, including taxes	—	448
6	{ Charge for the junctional service of railage, including taxes	—	030
	{ Charge for the junctional service of haulage	—	060
8	{ Charge for the 1st terminal service of clerkage	750	I 500
	{ Charge for the 2nd terminal service of clerkage	750	
9	{ Charge for risk		180
	{ Charge for extraneous services		060
Total amount of charges for terminal and junctional services, liabilities, and obligations			4 968

Rates for the interterminal services of railage, haulage, and truckage, relating to loads, have been calculated at 30d. per ton, per mile (Ex. 1). It has been shown that traders who provide trucks to carry coal and analogous merchandise are entitled to a reduction of rates amounting to 02d per ton of load, per mile. The same conditions exist when the trucks are used for the purpose of carrying return-loads, consisting of other kinds of merchandise, from stations to private sidings, the amount due to the railway company being 28d. per ton of load, per mile

## EXAMPLE 31

SOUTH NORTHERN RAILWAY COMPANY

*Merchandise carried in traders' wagons that would otherwise be returned, empty, to the freight  
agents—United rates and charges for non-entire distances*

Fr-IPS-TW. Weight of load		Any weight which a wagon may safely carry		
Weight of wagon . . .		Any weight		
Unit-weight of load . . .		Total I		
Ref to the Nos of Examples 30		Per ton of load d		
Total amount of charges for terminal and junctional services, liabilities, and obligations		4 968		
Minimum charge per consignment, 5d				
I	Rate for the initial distance, including taxes	30		
Rates of progression	Consecutive distances	Prog Nos corresponding with the Nos. of scales of rates	Rates alone, stated in pence and fractions of a penny	
			Rates united with the total amount of charges, stated in shillings and pence, without fractions	
1 1/4 miles	Over 1 1/4 miles and not exceeding 2 1/4 "	1	d 30	s 0 d 5
	" 2 1/4 " " " 3 1/4 "	2	60	0 6
	" 3 1/4 " " " 4 1/4 "	3	90	0 6
	" 4 1/4 " " " 5 1/4 "	4	1 20	0 6
	" 5 1/4 " " " 6 1/4 "	5	1 50	0 6
	" 6 1/4 " " " 7 1/4 "	6	1 80	0 7
	" 7 1/4 " " " 8 1/4 "	7	2 10	0 7
	" 8 1/4 " " " 9 1/4 "	8	2 40	0 7
	" 9 1/4 " " " 10 1/4 "	9	2 70	0 8
	" 10 1/4 " " " 11 1/4 "	10	3 00	0 8
	" 11 1/4 " " " 12 1/4 "	11	3 30	0 8
	" 12 1/4 " " " 13 1/4 "	12	3 60	0 9
	" 13 1/4 " " " 14 1/4 "	13	3 90	0 9
	" 14 1/4 " " " 15 1/4 "	14	4 20	0 9
	" 15 1/4 " " " 16 1/4 "	15	4 50	0 9
2 1/4 miles	" 16 1/4 " " " 18 1/4 "	16	4 80	0 10
	" 18 1/4 " " " 20 1/4 "	18	5 40	0 10
	" 20 1/4 " " " 22 1/4 "	20	6 00	0 11
	" 22 1/4 " " " 24 1/4 "	22	6 60	1 0
	" 24 1/4 " " " 26 1/4 "	24	7 20	1 0
	" 26 1/4 " " " 28 1/4 "	26	7 80	1 1
	" 28 1/4 " " " 30 1/4 "	28	8 40	1 1
	" 30 1/4 " " " 32 1/4 "	30	9 00	1 2
	" 32 1/4 " " " 34 1/4 "	32	9 60	1 3
	" 34 1/4 " " " 36 1/4 "	34	10 20	1 3
	" 36 1/4 " " " 38 1/4 "	36	10 80	1 4
	" 38 1/4 " " " 40 1/4 "	38	11 40	1 4
	" 40 1/4 " " " 42 1/4 "	40	12 00	1 5
	" 42 1/4 " " " 44 1/4 "	42	12 60	1 6
	" 44 1/4 " " " 46 1/4 "	44	13 20	1 6

EXAMPLE 31 (*continued*).

Fr-IPS-TW. Weight of load Weight of wagon		Any weight which a wagon may safely carry Any weight		
Unit-weight of load		Ton I		
Ref to the Nos of Examples 30	Total amount of charges for terminal and junctional services, liabilities, and obligations Minimum charge, per consignment, 5 <i>d</i> .	Per ton of load <i>d</i>  4 96 <i>S</i>		
I	Rate for the initial distance, including taxes	30		
Rates of progression	Consecutive distances	Prog Nos. corresponding with the Nos of scales of rates	Rates alone, stated in pence and fractions of a penny	Rates united with the total amount of charges, stated in shillings and pence, without fractions
2 $\frac{1}{4}$ miles	Over 48 $\frac{1}{4}$ miles and not exceeding 50 $\frac{1}{4}$ miles	46	<i>d</i> 13 80	<i>s</i> <i>d</i> I 7
	" 50 $\frac{1}{4}$ " " " 52 $\frac{1}{4}$ "	48	14 40	I 7
	" 52 $\frac{1}{4}$ " " " 54 $\frac{1}{4}$ "	50	15 00	I 8
	" 54 $\frac{1}{4}$ " " " 56 $\frac{1}{4}$ "	52	15 60	I 9
	" 56 $\frac{1}{4}$ " " " 58 $\frac{1}{4}$ "	54	16 20	I 9
	" 58 $\frac{1}{4}$ " " " 61 $\frac{1}{4}$ "	56	16 80	I 10
	" 61 $\frac{1}{4}$ " " " 63 $\frac{1}{4}$ "	58	17 40	I 10
	" 63 $\frac{1}{4}$ " " " 65 $\frac{1}{4}$ "	60	18 00	I 11
	" 65 $\frac{1}{4}$ " " " 67 $\frac{1}{4}$ "	62	18 60	2 0
	" 67 $\frac{1}{4}$ " " " 69 $\frac{1}{4}$ "	64	19 20	2 0
3 $\frac{1}{4}$ miles	" 69 $\frac{1}{4}$ " " " 72 $\frac{1}{4}$ "	67	20 10	2 1
	" 72 $\frac{1}{4}$ " " " 76 $\frac{1}{4}$ "	70	21 00	2 2
	" 76 $\frac{1}{4}$ " " " 79 $\frac{1}{4}$ "	73	21 90	2 3
	" 79 $\frac{1}{4}$ " " " 82 $\frac{1}{4}$ "	76	22 80	2 4
	" 82 $\frac{1}{4}$ " " " 85 $\frac{1}{4}$ "	79	23 70	2 5
	" 85 $\frac{1}{4}$ " " " 88 $\frac{1}{4}$ "	82	24 60	2 6
	" 88 $\frac{1}{4}$ " " " 92 $\frac{1}{4}$ "	85	25 50	2 6
	" 92 $\frac{1}{4}$ " " " 95 $\frac{1}{4}$ "	88	26 40	2 7
	" 95 $\frac{1}{4}$ " " " 98 $\frac{1}{4}$ "	91	27 30	2 8
	" 98 $\frac{1}{4}$ " " " 101 $\frac{1}{4}$ "	94	28 20	2 9
	" 101 $\frac{1}{4}$ " " " 105 " "	97	29 10	2 10
	" 105 " " " 108 $\frac{1}{4}$ "	100	30 00	2 11
	" 108 $\frac{1}{4}$ " " " 111 $\frac{1}{4}$ "	103	30 90	3 0
	" 111 $\frac{1}{4}$ " " " 114 $\frac{1}{4}$ "	106	31 80	3 1
	" 114 $\frac{1}{4}$ " " " 117 $\frac{1}{4}$ "	109	32 70	3 2
	" 117 $\frac{1}{4}$ " " " 121 $\frac{1}{4}$ "	112	33 60	3 3
	" 121 $\frac{1}{4}$ " " " 124 $\frac{1}{4}$ "	115	34 50	3 3
	" 124 $\frac{1}{4}$ " " " 127 $\frac{1}{4}$ "	118	35 40	3 4
" 127 $\frac{1}{4}$ " " " 130 $\frac{1}{4}$ "	121	36 30	3 5	
" 130 $\frac{1}{4}$ " " " 133 $\frac{1}{4}$ "	124	37 20	3 6	



EXAMPLE 31 (*continued*)

Fr-IPS-TW. Weight of load			(Any weight which a wagon may safely carry)	
Weight of wagon			Any weight	
Unit-weight of load			Ton I	
Ref to the Nos of Examples			Per ton of load <i>d</i>	
30	Total amount of charges for terminal and junctional services, liabilities, and obligations Minimum charge, per consignment, 5 <i>d</i>		4 968	
I	Rate for the initial distance, including taxes		30	
Rates of progression	Consecutive distances		Prog. Nos. corresponding with the Nos of scales of rates	
			Rates alone, stated in pence and fractions of a penny	
3 1/4 miles	Over 133 1/4 miles and not exceeding 137 1/4 miles		<i>d</i>	<i>s d</i>
	" 137 1/4 "	" 140 1/4 "	127	38 10
	" 140 1/4 "	" 143 1/4 "	130	39 00
	" 143 1/4 "	" 146 1/4 "	133	39 90
	" 146 1/4 "	" 150 "	136	40 80
	" 150 "	" 153 1/4 "	139	41 70
	" 153 1/4 "	" 156 1/4 "	142	42 60
	" 156 1/4 "	" 159 1/4 "	145	43 50
	" 159 1/4 "	" 162 1/4 "	148	44 40
	" 162 1/4 "	" 166 1/4 "	151	45 30
	" 166 1/4 "	" 169 1/4 "	154	46 20
	" 169 1/4 "	" 172 1/4 "	157	47 10
	" 172 1/4 "	" 175 1/4 "	160	48 00
	" 175 1/4 "	" 178 1/4 "	163	48 90
	" 178 1/4 "	" 182 1/4 "	166	49 80
	" 182 1/4 "	" 185 1/4 "	169	50 70
	" 185 1/4 "	" 188 1/4 "	172	51 60
	" 188 1/4 "	" 191 1/4 "	175	52 50
	" 191 1/4 "	" 195 "	178	53 40
	" 195 "	" 198 1/4 "	181	54 30
	" 198 1/4 "	" 201 1/4 "	184	55 20
	" 201 1/4 "	" 204 1/4 "	187	56 10
	" 204 1/4 "	" 207 1/4 "	190	57 00
	" 207 1/4 "	" 211 1/4 "	193	57 90
	" 211 1/4 "	" 214 1/4 "	196	58 80
	" 214 1/4 "	" 217 1/4 "	199	59 70

Instead of reducing the rates, it is preferable to increase, in a correspondingly needful degree, the distances to which they apply. Therefore, let the initial distance, to which the rate of 30*d* per ton of load is to apply, be  $1\frac{1}{4}$  miles instead of 1 mile, and let the consecutive distances to which the successive rates are to apply be multiples of  $1\frac{1}{4}$  miles, agreeing with the distances in Example 29

Return loads are usually of considerable weight, but occasionally they are light. To guard against loss arising from the smallness of consignments it is needful to establish a minimum charge. Let the minimum charge for a consignment forming a return-load be fivepence, or the amount of the rate and the total amount of charges for services, etc., combined, for conveying a return-load, weighing 1 ton,  $1\frac{1}{4}$  miles, the initial distance

Example 31 (pp. 265–267) forms a complete Table (Table VI) of Rates and Charges, per ton of load, for merchandise of various kinds constituting the sixth division of traffic—although includible in other divisions—when conveyed from stations to private sidings in trucks provided by traders, which have been used to carry coal or analogous merchandise, and which would otherwise be returned empty to private sidings. The initial distance is  $1\frac{1}{4}$  miles, and the rate applying thereto 30*d*. per ton of load. For convenience of illustration, two columns are made use of. Above the columns is entered the total amount of charges per ton of load, for terminal and junctional services, liabilities, and obligations, taken from Example 30. In the first column, the rates are stated in pence and fractions of a penny, apart from the total amount of charges. In the second column they are individually added to the total amount of charges, and stated in shillings and pence. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being called pence. The rates, alone and when combined with the total amount of charges, are progressively numbered, the Nos corresponding with the Nos of the scales of united rates and charges employed in previous Tables. The consecutive distances extend from  $1\frac{1}{4}$  to  $214\frac{4}{4}$  miles, and the rate of progression is increased, after  $16\frac{1}{4}$  miles, from  $1\frac{1}{4}$  to  $2\frac{2}{4}$  miles, and after  $69\frac{9}{4}$  miles, from  $2\frac{2}{4}$  to  $3\frac{3}{4}$  miles, as in Example 29. The minimum charge, per consignment, is also stated.

## CHAPTER XVII

### SOUTH NORTHERN RAILWAY COMPANY

#### VEHICLES, RUNNING ON THEIR OWN WHEELS

ROLLING-STOCK, a descriptive term adopted by railway companies, comprehends locomotives, tenders, wagons, brake-vans, and vehicles of all kinds that run on railways. Large railway companies construct their own rolling stock, and, for this purpose, each company has to provide the different kinds of plant that are necessary, and employ many artisans.

Traders who follow the business of constructing railway vehicles, whether locomotives, wagons, or any other description, are usually located in the neighbourhood of a railway where it is possible to acquire land, make sidings, and, by means of junctions, connect them with the railway.

Colliery proprietors and others who have to provide their own locomotives and wagons, ordinarily purchase them from private firms. Traders who have to provide wagons only, buy or hire them, new or second-hand, from the makers or from other traders.

In most cases, it may be assumed that new vehicles, running on their own wheels, are conveyed from private sidings to private sidings.

Owing to continuous use or to accidents, repairs are occasionally necessary; the mischief done being often of such a character as to allow the vehicles to be conveyed, running on their own wheels, to the sidings of the makers or of other firms who execute repairs. Thus the requirements of traders occasion the conveyance of vehicles, running on their own wheels to, as well as from, the private sidings of firms whose business is to construct or repair such vehicles.

Let it be supposed that railway vehicles of all kinds, constituting the seventh division of traffic, are conveyed, running on their own wheels, between private sidings and private sidings, and let the symbols  $Gr-IPSi-TW$ , be employed to denote that merchandise of this description is conveyed by one railway company only, under the conditions stated

In the circumstances presumed, the interterminal, terminal, and

junctional services of truckage relating to vehicles, running on their own wheels, are rendered by traders. The interterminal services of railage and haulage relating to vehicles, running on their own wheels, and to the instruments of power, and the interterminal service of truckage relating to the instruments of power only, are fulfilled by the railway company.

The terminal and junctional services, liabilities and obligations, fulfilled or undertaken by the railway company, in relation to vehicles, running on their own wheels, conveyed under the conditions stated, are as follows.—

The first and second terminal services of stoppage, with taxes.

Two junctional services of stoppage, with taxes.

The junctional service of railage, with taxes.

The junctional service of haulage.

The first and second terminal services of clerkage.

Risk

Extraneous services.

Rates for the interterminal services of railage, haulage, and truckage, relating to wagons and inclusive of vehicles carrying the instruments of power, have been calculated at  $\cdot 30d.$  per ton of wagon, per mile (Ex. 1). The conveyance of vehicles, running on their own wheels, as merchandise, relieves railway companies of the duty of rendering the interterminal service of truckage, so far as it relates to such vehicles, and, consequently, entitles traders to a reduction of rates amounting to  $02d.$  per ton of vehicle, per mile, or one-fifteenth of  $\cdot 30d.$ ,  $\cdot 28d.$  per ton of vehicle, per mile, being still due to the railway company. Instead of reducing the rates, it is preferable to increase, in a correspondingly needful degree, the distances to which they apply. Therefore, let the initial distance, to which the rate of  $\cdot 30d.$  per ton of vehicle is to apply, be  $1\frac{1}{4}$  miles instead of 1 mile, and let the consecutive distances, to which the successive rates are to apply, be multiples of  $1\frac{1}{4}$  miles, agreeing with the distances in Example 29.

The sum, per ton of wagon, employed to compute charges for each kind of service, liability or obligation, now becomes the charge itself. One column, therefore, will suffice to contain the respective charges, per ton of vehicle, due to the railway company.

Charges for risk have been computed at  $\cdot 180d.$  per ton of load and  $\cdot 120d.$  per ton of wagon. Since vehicles only are now concerned, the latter sum must be employed as the charge, per ton, for risk.

A complete list of charges, per ton of vehicle, for terminal and junctional services, liabilities, and obligations, applicable to vehicles running on their own wheels, conveyed under the conditions stated, is furnished in Example 32, the first of the two following Examples, due

reference being made to the numbers of Examples from which the sums forming the respective charges are taken.

Example 33 forms a complete Table (Table VII) of Rates and Charges, per ton of vehicle, for locomotives, tenders, wagons, and other kinds of vehicles, running on their own wheels, constituting the seventh division of traffic, when conveyed between private sidings and private sidings. The initial distance is  $1\frac{1}{4}$  miles, and the rate, applying thereto, 30d per ton of vehicle. For convenience of illustration, two columns

# EXAMPLE 32

## SOUTH NORTHERN RAILWAY COMPANY

*Vehicles, running on their own wheels—Charges for terminal and junctional services, liabilities, and obligations*

Gr-I-P-S-T-W Weight of vehicle . .		{ Any weight of vehicle which may safely travel on the railway	
Unit-weight of vehicle . .		Ton I	
Ref. to the Nos of Examples	Per ton of vehicle d	Per ton of vehicle d	
27	{ Charge for the 1st terminal service of stoppage, including taxes . . . . .	I 120	2 240
	{ Charge for the 2nd terminal service of stoppage, including taxes . . . . .	I 120	
27	Charge for two junctional services of stoppage, including taxes . . . . .	—	448
6	{ Charge for the junctional service of railage, including taxes . . . . .	—	030
8	{ Charge for the junctional service of haulage . . . . .	—	060
	{ Charge for the 1st terminal service of clerkage . . . . .	750	I 500
9	{ Charge for the 2nd terminal service of clerkage . . . . .	750	
	{ Charge for risk . . . . .	—	120
	{ Charge for extraneous services . . . . .	—	060
Total amount of charges for terminal and junctional services, liabilities, and obligations . . . . .		4 458	

are made use of. Above the columns is entered the total amount of charges, per ton of vehicle, for terminal and junctional services, liabilities, and obligations, taken from Example 32. In the first column, the rates are stated in pence and fractions of a penny, apart from the total amount of charges. In the second column they are individually added to the total amount of charges, and stated in shillings and pence. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being called pence. The rates, alone and in union with the total amount of charges, are progressively

# EXAMPLE 33

## SOUTH NORTHERN RAILWAY COMPANY

Vehicles, running on their own wheels—United rates and charges for consecutive distances

G1-rPS1-TW. Weight of vehicle .			{ Any weight of vehicle which may safely travel on the railway	
Unit-weight of vehicle			Ton I	
Ref to the Nos of Examples 32	Total amount of charges for terminal and junctional services, liabilities, and obligations		Per ton of vehicle <i>d</i> 4 458	
I	Rate for the initial distance, including taxes		30	
Rates of progression	Consecutive distances	Prog Nos corresponding with the Nos of scales of rates	Rates alone, stated in pence and fractions of a penny	Rates united with the total amount of charges, stated in shillings and pence, without fractions
1 1/4 miles	Over 1 1/4 miles and not exceeding 2 3/4 "	1	<i>d</i> 30	<i>s</i> <i>d</i> 0 5
	" 2 3/4 " " " " 3 1/4 "	2	60	0 5
	" 3 1/4 " " " " 4 1/4 "	3	90	0 5
	" 4 1/4 " " " " 5 1/4 "	4	1 20	0 6
	" 5 1/4 " " " " 6 1/4 "	5	1 50	0 6
	" 6 1/4 " " " " 7 1/4 "	6	1 80	0 6
	" 7 1/4 " " " " 8 1/4 "	7	2 10	0 7
	" 8 1/4 " " " " 9 1/4 "	8	2 40	0 7
	" 9 1/4 " " " " 10 1/4 "	9	2 70	0 7
	" 10 1/4 " " " " 11 1/4 "	10	3 00	0 7
	" 11 1/4 " " " " 12 1/4 "	11	3 30	0 8
	" 12 1/4 " " " " 13 1/4 "	12	3 60	0 8
	" 13 1/4 " " " " 14 1/4 "	13	3 90	0 8
	" 14 1/4 " " " " 15 1/4 "	14	4 20	0 9
	" 15 1/4 " " " " 16 1/4 "	15	4 50	0 9
2 1/4 miles	" 16 1/4 " " " " 18 3/4 "	16	4 80	0 9
	" 18 3/4 " " " " 20 5/4 "	18	5 40	0 10
	" 20 5/4 " " " " 22 7/4 "	20	6 00	0 10
	" 22 7/4 " " " " 24 9/4 "	22	6 60	0 11
	" 24 9/4 " " " " 26 1 1/4 "	24	7 20	1 0
	" 26 1 1/4 " " " " 28 1 3/4 "	26	7 80	1 0
	" 28 1 3/4 " " " " 31 1/4 "	28	8 40	1 1
	" 31 1/4 " " " " 33 1/4 "	30	9 00	1 1
	" 33 1/4 " " " " 35 5/4 "	32	9 60	1 2
	" 35 5/4 " " " " 37 7/4 "	34	10 20	1 3
	" 37 7/4 " " " " 39 9/4 "	36	10 80	1 3
	" 39 9/4 " " " " 41 1 1/4 "	38	11 40	1 4
	" 41 1 1/4 " " " " 43 1 3/4 "	40	12 00	1 4
	" 43 1 3/4 " " " " 46 1/4 "	42	12 60	1 5
	" 46 1/4 " " " " 48 3/4 "	44	13 20	1 6

## EXAMPLE 33 (continued)

GI-IPSI-TW. Weight of vehicle					Any weight of vehicle which may safely travel on the railway	
Unit-weight of vehicle					Ton 1	
Ref to the Nos. of Examples 32 Total amount of charges for terminal and junctional services, liabilities, and obligations					Per ton of vehicle d.	
1 Rate for the initial distance, including taxes					30	
Rates of progression	Consecutive distances			Prog. Nos. corresponding with the Nos. of scales of rates	Rates alone, stated in pence and fractions of a penny	Rates united with the total amount of charges, stated in shillings and pence, without fractions
2 1/4 miles	Over	48 1/4 miles and not exceeding	50 1/4 miles	46	13 80	1 6
	"	50 1/4 " " "	52 1/4 "	48	14 40	1 7
	"	52 1/4 " " "	54 1/4 "	50	15 00	1 7
	"	54 1/4 " " "	56 1/4 "	52	15 60	1 8
	"	56 1/4 " " "	58 1/4 "	54	16 20	1 9
	"	58 1/4 " " "	61 1/4 "	56	16 80	1 9
	"	61 1/4 " " "	63 1/4 "	58	17 40	1 10
	"	63 1/4 " " "	65 1/4 "	60	18 00	1 10
	"	65 1/4 " " "	67 1/4 "	62	18 60	1 11
	"	67 1/4 " " "	69 1/4 "	64	19 20	2 0
3 1/4 miles	"	69 1/4 " " "	72 1/4 "	67	20 10	2 1
	"	72 1/4 " " "	76 1/4 "	70	21 00	2 1
	"	76 1/4 " " "	79 1/4 "	73	21 90	2 2
	"	79 1/4 " " "	82 1/4 "	76	22 80	2 3
	"	82 1/4 " " "	85 1/4 "	79	23 70	2 4
	"	85 1/4 " " "	88 1/4 "	82	24 60	2 5
	"	88 1/4 " " "	92 1/4 "	85	25 50	2 6
	"	92 1/4 " " "	95 1/4 "	88	26 40	2 7
	"	95 1/4 " " "	98 1/4 "	91	27 30	2 8
	"	98 1/4 " " "	101 1/4 "	94	28 20	2 9
3 1/2 miles	"	101 1/4 " " "	105 1/4 "	97	29 10	2 10
	"	105 1/4 " " "	108 1/4 "	100	30 00	2 10
	"	108 1/4 " " "	111 1/4 "	103	30 90	2 11
	"	111 1/4 " " "	114 1/4 "	106	31 80	3 0
	"	114 1/4 " " "	117 1/4 "	109	32 70	3 1
	"	117 1/4 " " "	121 1/4 "	112	33 60	3 2
	"	121 1/4 " " "	124 1/4 "	115	34 50	3 3
	"	124 1/4 " " "	127 1/4 "	118	35 40	3 4
	"	127 1/4 " " "	130 1/4 "	121	36 30	3 5
	"	130 1/4 " " "	133 1/4 "	124	37 20	3 6

EXAMPLE 33 (*continued*)

G1-1PS1-TW. Weight of vehicle			Any weight of vehicle which may safely travel on the railway	
Unit-weight of vehicle			Ton 1	
Ref to the Nos of Examples	Total amount of charges for terminal and junctional services, liabilities, and obligations		Per ton of vehicle <i>d</i>	
	Rate for the initial distance, including taxes		4 45 <sup>8</sup> 30	
Rates of progression	Consecutive distances	Prog Nos corresponding with the Nos of scales of rates	Rates alone, stated in pence and fractions of a penny	Rates united with the total amount of charges, stated in shillings and pence, without fractions
31 <sup>1</sup> / <sub>4</sub> miles	Over 1331 <sup>1</sup> / <sub>4</sub> miles and not exceeding 1371 <sup>3</sup> / <sub>4</sub> miles	127	<i>d</i> 38 10	<i>s</i> <i>d</i> 3 7
	" 1371 <sup>3</sup> / <sub>4</sub> " " " 1401 <sup>5</sup> / <sub>4</sub> "	130	39 00	3 7
	" 1401 <sup>5</sup> / <sub>4</sub> " " " 1431 <sup>7</sup> / <sub>4</sub> "	133	39 90	3 8
	" 1431 <sup>7</sup> / <sub>4</sub> " " " 1461 <sup>9</sup> / <sub>4</sub> "	136	40 80	3 9
	" 1461 <sup>9</sup> / <sub>4</sub> " " " 150 "	139	41 70	3 10
	" 150 " " " 1531 <sup>1</sup> / <sub>4</sub> "	142	42 60	3 11
	" 1531 <sup>1</sup> / <sub>4</sub> " " " 1561 <sup>3</sup> / <sub>4</sub> "	145	43 50	4 0
	" 1561 <sup>3</sup> / <sub>4</sub> " " " 1591 <sup>5</sup> / <sub>4</sub> "	148	44 40	4 1
	" 1591 <sup>5</sup> / <sub>4</sub> " " " 1621 <sup>7</sup> / <sub>4</sub> "	151	45 30	4 2
	" 1621 <sup>7</sup> / <sub>4</sub> " " " 1661 <sup>9</sup> / <sub>4</sub> "	154	46 20	4 3
	" 1661 <sup>9</sup> / <sub>4</sub> " " " 1691 <sup>1</sup> / <sub>4</sub> "	157	47 10	4 4
	" 1691 <sup>1</sup> / <sub>4</sub> " " " 1721 <sup>3</sup> / <sub>4</sub> "	160	48 00	4 4
	" 1721 <sup>3</sup> / <sub>4</sub> " " " 1751 <sup>5</sup> / <sub>4</sub> "	163	48 90	4 5
	" 1751 <sup>5</sup> / <sub>4</sub> " " " 1781 <sup>7</sup> / <sub>4</sub> "	166	49 80	4 6
	" 1781 <sup>7</sup> / <sub>4</sub> " " " 1821 <sup>9</sup> / <sub>4</sub> "	169	50 70	4 7
	" 1821 <sup>9</sup> / <sub>4</sub> " " " 1851 <sup>1</sup> / <sub>4</sub> "	172	51 60	4 8
	" 1851 <sup>1</sup> / <sub>4</sub> " " " 1881 <sup>3</sup> / <sub>4</sub> "	175	52 50	4 9
	" 1881 <sup>3</sup> / <sub>4</sub> " " " 1911 <sup>5</sup> / <sub>4</sub> "	178	53 40	4 10
	" 1911 <sup>5</sup> / <sub>4</sub> " " " 195 "	181	54 30	4 11
	" 195 " " " 1981 <sup>7</sup> / <sub>4</sub> "	184	55 20	5 0
	" 1981 <sup>7</sup> / <sub>4</sub> " " " 2011 <sup>9</sup> / <sub>4</sub> "	187	56 10	5 1
	" 2011 <sup>9</sup> / <sub>4</sub> " " " 2041 <sup>1</sup> / <sub>4</sub> "	190	57 00	5 1
	" 2041 <sup>1</sup> / <sub>4</sub> " " " 2071 <sup>3</sup> / <sub>4</sub> "	193	57 90	5 2
	" 2071 <sup>3</sup> / <sub>4</sub> " " " 2111 <sup>5</sup> / <sub>4</sub> "	196	58 80	5 3
	" 2111 <sup>5</sup> / <sub>4</sub> " " " 2141 <sup>7</sup> / <sub>4</sub> "	199	59 70	5 4



numbered ; the Nos. corresponding with the Nos. of the scales of united rates and charges employed in previous Tables. The consecutive distances extend from  $1\frac{1}{4}$  to  $21\frac{1}{4}$  miles, and the rate of progression is increased, after  $16\frac{1}{4}$  miles, from  $1\frac{1}{4}$  to  $2\frac{1}{4}$  miles, and after  $69\frac{1}{4}$  miles from  $2\frac{1}{4}$  to  $3\frac{1}{4}$  miles, as in Example 29

## CHAPTER XVIII

### SOUTH NORTHERN RAILWAY COMPANY

#### LIVE STOCK

CERTAIN domesticated animals, as horses, oxen, sheep and pigs, are bought and sold in a living state, and their conveyance by railway, under the designation of live stock, necessitates the provision of wagons built for the purpose. Some differences exist in the mode of constructing such wagons, but, usually, the sides of each are built as high as the limits of safety permit—interstices being left for ventilation—and are united at the top by a cover so as to screen the animals from the weather. Two doors, one on either side, furnish the means of entrance and exit. Large beasts, forming a full load, need all the room that a wagon affords, but less upper space is occupied when a truck is fully loaded with small animals. Where sheep form a large part of the traffic, wagons with two floors, one above the other, called sheep-cages, are provided by some railway companies, and, by this means, the cubic space for loading purposes is utilized to a greater extent. Wagons built in this fashion, however, are restricted to the conveyance of small animals, which is a disadvantage.

Animals of the same kind differ in size and weight according to age, breed, and condition, and, consequently, their respective numbers and weights constituting full loads for wagons, differ also. Consignments vary greatly in magnitude. In some instances, several wagons are required to carry one consignment of live stock. In other cases, animals are tendered, singly, to be forwarded, or fewer than are needed to fill a truck. To provide, suitably, for the diversities of consignments, some railway companies build wagons of three sizes or lengths, which are known as large, medium, and small cattle-wagons.

For the purposes of loading and unloading, wharfs, adjoining selected sidings, are built so as to be level with the floors of wagons, by means of which animals are enabled to walk in and out of the vehicles expeditiously and safely. At stations where there is much traffic, pens are constructed on the wharfs, in which animals belonging to the various traders are driven and kept apart, as may be convenient, before loading and after unloading.

The demand for fresh meat as food causes a weekly movement of live stock. In the first place, the animals are forwarded from the grazing districts, or from the ports to which they have been shipped, to the market-towns to be offered for sale. Secondly, after being sold, some are delivered to traders in the immediate locality, and some are consigned to traders in towns and villages more or less distant, to be slaughtered; the meat being prepared and sold for consumption. After the wagons have been used to convey live stock to the wholesale markets they may be again employed to carry the same animals, or a number of them, after change of owners, to stations in connection with other towns and villages. When the animals are finally disposed of, it is necessary to despatch the empty wagons, according to pre-ordained rule, to those stations at which consignments of live stock are regularly forthcoming, and thus the round is completed. The weekly conveyance of live stock for the purpose of providing food constitutes the largest part of the traffic, but other causes, as cattle-shows and fairs, contribute to swell the amount.

In these circumstances, it is reasonable to suppose that the weight of empty wagons is to the weight of loaded wagons, apart from the loads, conveyed one mile, and employed to carry live stock, relatively greater than if the wagons were available to receive loads at any station, as is the case with regard to wagons built to carry general merchandise.

Let it be supposed that live stock, constituting the eighth division of traffic, is conveyed from stations to stations in vehicles provided by the railway company, specially built for the purpose, and let the symbols,  $H_1$ , be used to signify that live stock is conveyed by one railway company only, under the conditions stated

Let it be assumed that the greatest weight of load, furnished by live stock, which a wagon may carry, is one and a quarter times the weight of the wagon itself.

Let it be supposed that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, is the same as of 1 to 2, or that the weight of each wagon carrying live stock requires to be increased by one-half in order to include the conveyance of empties.

On these grounds, when a cattle-wagon carries its greatest weight of load and the weight of the wagon has been increased by one-half to include the conveyance of empties, the weight of wagon proportionate to unit-weight of load will be  $1\frac{1}{2}$  ( $1\frac{6}{10}$ ) tons, corresponding to grade II.

Since consignments of animals vary greatly in magnitude it is necessary to employ a considerable number of grades to provide for contingencies. There is no need, however, to indicate the grades for full loads of live stock beyond stating the greatest number of each kind, according to age, breed, and condition, with the estimated weight that

may be placed in each size of wagon without unduly incommoding the animals. The weight of each load should be ascertained by the agency of approved machines, if possible, or, in the absence of other means, by estimating it. The weight of load for each size of wagon, obtained in the manner indicated, will approximate to one of the weights of loads employed to distinguish the grades, and the rates and charges, calculated for the grade indicated, will apply—with the proviso that a larger amount must not be charged for a less load than for a greater

Let it be assumed that three sizes of wagons are built to carry live stock, and that their lengths, average weights, and powers, are as follows —

	LENGTHS Feet	AVERAGE WEIGHTS. Tons	GREATEST WEIGHTS OF LOADS (LIVE STOCK) THAT THE WAGONS MAY CARRY Tons
Large wagons	18	6	$7\frac{1}{2}$
Medium wagons	15	5	$6\frac{1}{4}$
Small wagons	12	4	5

Let nineteen grades, Nos 11 to 29, inclusive, be assigned to live stock, constituting the eighth division of traffic, and let the weights of loads chosen to distinguish the grades, and to be joined with the respective weights of the three sizes of wagons, increased by one-half to include the conveyance of empties, be as in the table opposite

Let it be made a condition that if any consignment of live stock, carried in one of the three sizes of wagons assumed to be provided, weigh less than the weight of load appropriate for such wagon, employed to distinguish the final grade, it shall be charged not less than as for such distinguishing weight of load. Accordingly, the minimum weights of loads for consignments of live stock, carried in the three sizes of wagons adopted for illustration, will be one and three-tenths, one and one-tenth, and seven-eighths of a ton, respectively employed to distinguish grade 29.

Let it be understood that a consignment of live stock, occupying several wagons, is to be charged for according to the weight of load carried in each wagon. For instance, if two wagons are required to carry a consignment, one to contain cattle and the other to contain sheep, or if one is fully and the other only partially occupied by animals of one kind, different rates and charges must be employed to compute the amounts respectively due for the loads provided. When a railway company provides three sizes of wagons for the conveyance of live stock, it happens, occasionally, that wagons of suitable size for the various consignments tendered are not always available. Thus a large or medium cattle-wagon might be on hand at a station when a consignment of live stock is tendered for which a small wagon would be most

## TYPE STOCK,

*Forming the ex-hd deviation of traffic*

Nos of grades	Distinguishing weights of loads to be joined, individually, with 9 tons, or one and a half times the weight of a large wagon, 6 tons			Nos of grades	Distinguishing weights of loads to be joined, individually, with 7½ tons, or one and half times the weight of a medium wagon, 5 tons			Successive decreases of weight	Nos of grades	Distinguishing weights of loads to be joined, individually, with 6 tons, or one and a half times the weight of a small wagon, 4 tons			Successive decreases of weight
	Tons	or	cwt. qrs		Tons	or	cwt. qrs			Tons	or	cwt. qrs	
11	7½		10 0	11	6½		5 0	Cwts qrs	11	5½		5 0	Cwts qrs
12	6½		6 15 0	12	5½		5 12 2	12 2	12	4½		4 10 0	10 0
13	6½		6 3 0	13	5½		5 2 2	10 0	13	4½		4 2 0	8 0
14	5½		5 10 0	14	4½		4 12 0	10 2	14	3½		3 13 2	8 2
15	5		5 0 0	15	4½		4 3 2	8 2	15	3½		3 0 2	7 0
16	4½		4 10 0	16	3½		3 15 0	8 2	16	3		3 0 0	6 2
17	4½		4 2 0	17	3½		3 8 0	7 0	17	2½		2 14 2	5 2
18	3½		3 15 0	18	3½		3 2 2	5 2	18	2½		2 10 0	4 2
19	3½		3 8 2	19	2½		2 17 0	5 2	19	2½		2 5 2	4 2
20	3½		3 2 0	20	2½		2 12 0	5 0	20	2½		2 1 2	4 0
21	2½		2 10 0	21	2½		2 7 0	5 0	21	1½		1 17 2	4 0
22	2½		2 11 0	22	2½		2 2 2	4 2	22	1½		1 14 0	3 2
23	2½		2 6 0	23	1½		1 18 2	4 2	23	1½		1 11 0	3 0
24	2½		2 2 0	24	1½		1 15 0	3 2	24	1½		1 8 0	3 0
25	1½		1 18 0	25	1½		1 12 0	3 0	25	1½		1 5 2	2 2
26	1½		1 14 2	26	1½		1 0 2	3 0	26	1½		1 3 0	2 2
27	1½		1 11 2	27	1½		1 0 2	2 2	27	1½		1 1 0	2 0
28	1½		1 8 2	28	1½		1 1 0	2 2	28	1½		0 10 0	2 0
29	1½		1 6 0	29	1½		1 2 0	2 0	29	1		0 17 2	1 2

suitable. Or, a consignment might have a magnitude exceeding the capacity of any one of the three sizes of wagons provided, but not sufficient to fully occupy two wagons. In any of these events, the weight of the wagon—increased by one-half to include the conveyance of empties—as well as the weight of the load which it carries, must, together, form the subject of calculation with regard to the amount due for transport. This procedure is consequent on the conditions presupposed, and is necessary for the maintenance of equity.

It is reasonable to suppose that traders in live stock know, from experience, the respective capacities of cattle-wagons, and that they regulate their consignments to accord with them. When two or more sizes of cattle-wagons are provided on any railway, it is the duty of the railway company to arrange, if possible, so as to have wagons of each size available at every station whence live stock is commonly forwarded. On occasions, however, it may be necessary, through no fault of the railway company, to use wagons of larger size than are needful for the conveyance of live stock. In such cases, the rates and charges must be in agreement with the conditions existing.

At certain stations, live stock is periodically offered for transport in such large quantities that it is needful to appoint trains to convey it, exclusively, to the respective stations to which it is consigned. At stations that have not much of this kind of traffic, it is found convenient to join wagons containing live stock with wagons containing other kinds of traffic, to form trains. Empty cattle-wagons are, also, conveyed separately or joined with other descriptions of wagons, according to circumstances.

When cattle-wagons have been discharged they may be reloaded at the same stations or sent, empty, to other stations to be loaded. In the former case, it is seldom that the reloading can take place forthwith. Meantime, the wagons have to be moved from the cattle sidings, or sidings skirting the wharfs, to sidings that are more convenient for waiting purposes, where they remain until again in request. After being loaded, they need to be prepared for departure without delay, and conveyed to their destinations as speedily as possible.

In many instances, wagons containing live stock are discharged soon after arrival at the receiving stations. In other cases, some time elapses before unloading takes place. Generally, it is necessary for the wagons to be placed in position for unloading very soon after arrival at the receiving stations. To accomplish this, the second terminal service of haulage, instead of being performed at intervals and when the circumstances are favourable—as happens with regard to merchandise, ordinarily—needs to be executed immediately, and the operation involves the removal of all vehicles that obstruct the way to the cattle sidings. Thus the second terminal service of haulage, performed in

relation to live stock, though seeming to occupy less time than when fulfilled in regard to merchandise in other divisions of traffic, occasions considerable expense.

Charges for the first and second terminal services of railage, haulage, and truckage, fulfilled in reference to live stock, need to be calculated afresh, because the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, is altered, and also because the length of time during which the second terminal services are performed is less than that required with regard to merchandise in other divisions of traffic.

Let it be assumed that when cattle-wagons are discharged at stations, and have to be sent, empty, to other stations to be loaded, one day is required to move them from the sidings in which they stand, place them in position for departure, and despatch them. On arriving at the stations where they have to be loaded, let it be supposed that half a day is required to place them in position for loading, and half a day to load, marshal, and despatch them. If the wagons can be reloaded at the stations where they have been discharged, let it be assumed that half a day is needed to place them in position for loading, and half a day to load, marshal, and despatch them. These times coincide with those assumed to be required in relation to general merchandise. In reference to empty wagons that are conveyed from stations at which they have been discharged to other stations to be loaded, portions of the first terminal services of railage, haulage, and truckage, are performed at second terminal stations, and portions at first terminal stations. It is expedient that charges for the former portions should be added to charges for the second terminal services of the same denomination.

Let it be supposed that the maximum period of time allowed for cattle-wagons to remain under load at second terminal stations, for the convenience of traders, is three-quarters of a day, and that the average period of time during which they remain before they are discharged, taking all wagons into account, is half a day. By this assumption, the average length of time during which the second terminal services of railage, haulage, and truckage, are performed, in relation to loaded wagons, is half a day.

Let the sums chosen to compute charges for that portion of the first terminal service of railage which is rendered at first terminal stations in relation to live stock, during a period of half a day, be 150*l.* per ton of load, and, during a period of one day, 300*l.* per ton of wagon, including taxes and profit. The weights of wagons carrying loads have been increased by one-half to include the conveyance of empties. They now need to be decreased by one-third. Instead of altering the weights, it will be more convenient to decrease, in a corresponding degree, the sum to be employed as a factor with the weights. Therefore, let 200*l.* per

## EXAMPLE 34

SOUTH NORTHERN

*Live Stock—Charges for the first and*

NOS. OF GRADES	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons
<b>Hi</b> Distinguishing weights of loads for large wagons (1)	7½	6¾	6¾	5½	5	4½
Average weights of wagons (6 tons + 3 tons for empties)	9	9	9	9	9	9
<b>Hi.</b> Distinguishing weights of loads for medium wagons (2)	6½	5⅝	5⅝	4¾	4¾	3¾
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½
<b>Hi</b> Distinguishing weights of loads for small wagons (3)	5	4½	4½	3¾	3¾	3
Average weights of wagons (4 tons + 2 tons for empties)	6	6	6	6	6	6
Unit-weights of loads	1	1	1	1	1	1
Proportionate weights of wagons	1⅝	1⅝	1⅝	1⅝	1¾	2
Totals	2⅝	2⅝	2⅝	2⅝	2¾	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of railage, computed at 150¢ per ton of load	150	150	150	150	150	150
And at 200¢ per ton of wagon	240	266	293	326	360	400
Total charges for a portion of the 1st terminal service of railage	390	416	443	476	510	550
Charges for the 2nd terminal service of railage, computed at 150¢ per ton of load	150	150	150	150	150	150
And at 100¢ per ton of wagon	120	133	146	163	180	200
Charges for that portion of the 1st terminal service of railage which is rendered at 2nd terminal stations, computed at 100¢ per ton of wagon	120	134	147	164	180	200
Total charges for the 2nd and a portion of the 1st terminal service of railage	390	417	443	477	510	550
Total charges for the 1st and 2nd terminal services of railage, including taxes	780	833	886	953	1 020	1 100



## RAILWAY COMPANY

*second terminal services of rail age*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$4\frac{1}{10}$	$3\frac{3}{4}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$2\frac{1}{5}$	$2\frac{1}{10}$	$2\frac{2}{10}$	$2\frac{1}{10}$	$1\frac{9}{10}$	$1\frac{2}{10}$	$1\frac{2}{10}$	$1\frac{7}{10}$	$1\frac{2}{10}$
9	9	9	9	9	9	9	9	9	9	9	9	9
$3\frac{2}{5}$	$3\frac{1}{8}$	$2\frac{1}{10}$	$2\frac{1}{5}$	$2\frac{7}{10}$	$2\frac{1}{5}$	$1\frac{3}{10}$	$1\frac{3}{4}$	$1\frac{3}{8}$	$1\frac{9}{10}$	$1\frac{3}{10}$	$1\frac{1}{8}$	$1\frac{1}{10}$
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$
$2\frac{2}{10}$	$2\frac{1}{2}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$1\frac{7}{8}$	$1\frac{7}{10}$	$1\frac{1}{10}$	$1\frac{2}{5}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$\frac{7}{8}$
6	6	6	6	6	6	6	6	6	6	6	6	6
$1\frac{1}{20}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{1}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$
$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{2}{10}$	$5\frac{1}{10}$	$5\frac{1}{10}$	$6\frac{1}{10}$	$6\frac{1}{10}$
$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{2}{10}$	$5\frac{1}{10}$	$5\frac{2}{10}$	$6\frac{1}{10}$	$6\frac{1}{10}$	$7\frac{1}{10}$	$7\frac{1}{10}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
150 440	150 480	150 526	150 580	150 640	150 706	150 780	150 860	150 946	150 1 040	150 1 140	150 1 253	150 1 373
590	630	676	730	790	856	930	1 010	1 096	1 190	1 290	1 403	1 523
150 220	150 240	150 263	150 290	150 320	150 353	150 390	150 430	150 473	150 520	150 570	150 626	150 686
220	240	264	290	320	354	390	430	474	520	570	627	687
590	630	677	730	790	857	930	1 010	1 097	1 190	1 290	1 403	1 523
1 180	1 260	1 353	1 460	1 580	1 713	1 860	2 020	2 193	2 380	2 580	2 806	3 046

## EXAMPLE 35

SOUTH NORTHERN

*Live stock—Charges for the first*

NOS OF GRADES	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons
Hi. Distinguishing weights of loads for large wagons (1)	7½	6¾	6¾	5½	5	4½
Average weights of wagons (6 tons + 3 tons for empties)	9	9	9	9	9	9
Hi. Distinguishing weights of loads for medium wagons (2)	6½	5½	5½	4¾	4¾	3¾
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½
Hi. Distinguishing weights of loads for small wagons (3)	5	4½	4½	3¾	3¾	3
Average weights of wagons (4 tons + 2 tons for empties)	6	6	6	6	6	6
Unit-weights of loads	1	1	1	1	1	1
Proportionate weights of wagons	1¾	1¾	1¾	1¾	1¾	2
Totals	2¾	2¾	2¾	2¾	2¾	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of haulage, computed at 300¢ per ton of load	300	300	300	300	300	300
And at 400¢ per ton of wagon	480	533	586	653	720	800
Total charges for a portion of the 1st terminal service of haulage	780	833	886	953	1 020	1 100
Charges for the 2nd terminal service of haulage, computed at 300¢ per ton of load	300	300	300	300	300	300
And at 200¢ per ton of wagon	240	267	293	327	360	400
Charges for that portion of the 1st terminal service of haulage which is performed at 2nd terminal stations, computed at 200¢ per ton of wagon	240	267	294	327	360	400
Total charges for the 2nd and a portion of the 1st terminal service of haulage	780	834	887	954	1 020	1 100
Total charges for the 1st and 2nd terminal services of haulage	1 560	1 667	1 773	1 907	2 040	2 200

RAILWAY COMPANY

*and second terminal services of haulage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
41 $\frac{1}{10}$	3 $\frac{3}{4}$	31 $\frac{7}{10}$	31 $\frac{1}{10}$	2 $\frac{3}{4}$	21 $\frac{1}{10}$	21 $\frac{1}{10}$	21 $\frac{1}{10}$	11 $\frac{1}{10}$	1 $\frac{3}{10}$	1 $\frac{2}{10}$	11 $\frac{1}{10}$	11 $\frac{1}{10}$
9	9	9	9	9	9	9	9	9	9	9	9	9
3 $\frac{3}{8}$	3 $\frac{3}{8}$	21 $\frac{7}{10}$	2 $\frac{3}{4}$	21 $\frac{7}{10}$	2 $\frac{3}{8}$	11 $\frac{7}{10}$	1 $\frac{3}{8}$	1 $\frac{3}{8}$	11 $\frac{7}{10}$	11 $\frac{7}{10}$	1 $\frac{3}{8}$	11 $\frac{7}{10}$
7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
21 $\frac{3}{10}$	2 $\frac{1}{2}$	21 $\frac{1}{10}$	21 $\frac{1}{10}$	1 $\frac{7}{8}$	11 $\frac{7}{10}$	11 $\frac{1}{10}$	1 $\frac{3}{8}$	11 $\frac{1}{10}$	11 $\frac{1}{10}$	11 $\frac{1}{10}$	1 $\frac{1}{10}$	7 $\frac{1}{8}$
6	6	6	6	6	6	6	6	6	6	6	6	6
11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$	11 $\frac{3}{10}$
31 $\frac{3}{10}$	31 $\frac{3}{10}$	31 $\frac{3}{10}$	31 $\frac{3}{10}$	41 $\frac{3}{10}$	41 $\frac{3}{10}$	41 $\frac{3}{10}$	51 $\frac{3}{10}$	51 $\frac{3}{10}$	61 $\frac{3}{10}$	61 $\frac{3}{10}$	71 $\frac{3}{10}$	71 $\frac{3}{10}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
300	300	300	300	300	300	300	300	300	300	300	300	300
880	960	1 053	1 160	1 280	1 413	1 560	1 720	1 893	2 080	2 280	2 506	2 746
1 180	1 260	1 353	1 460	1 580	1 713	1 860	2 020	2 193	2 380	2 580	2 806	3 046
300	300	300	300	300	300	300	300	300	300	300	300	300
440	480	527	580	640	707	780	860	947	1 040	1 140	1 253	1 373
440	480	527	580	640	707	780	860	947	1 040	1 140	1 254	1 374
1 180	1 260	1 354	1 460	1 580	1 714	1 860	2 020	2 194	2 380	2 580	2 807	3 047
2 360	2 520	2 707	2 920	3 160	3 427	3 720	4 040	4 387	4 760	5 160	5 613	6 093

## EXAMPLE 36

SOUTH NORTHERN

*Live stock—Charges for the first*

NOS OF GRADES	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons
<b>Hi.</b> Distinguishing weights of loads for large wagons (1)	7½	6¾	6¾	5½	5	4½
Average weights of wagons (6 tons + 3 tons for empties)	9	9	9	9	9	9
<b>Hi.</b> Distinguishing weights of loads for medium wagons (2)	6½	5½	5½	4¾	4¾	3¾
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½
<b>Hi.</b> Distinguishing weights of loads for small wagons (3)	5	4½	4½	3¾	3¾	3
Average weights of wagons (4 tons + 2 tons for empties)	6	6	6	6	6	6
Unit-weights of loads	1	1	1	1	1	1
Proportionate weights of wagons	1¾	1½	1¾	1½	1¾	2
Totals	2¾	2½	2¾	2¾	2¾	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of truckage, computed at 300¢ per ton of load	300	300	300	300	300	300
And at 400¢ per ton of wagon	480	536	586	653	720	800
Total charges for a portion of the 1st terminal service of truckage	780	833	886	953	1 020	1 100
Charges for the 2nd terminal service of truckage, computed at 300¢ per ton of load	300	300	300	300	300	300
And at 200¢ per ton of wagon	240	267	293	327	360	400
Charges for that portion of the 1st terminal service of truckage which is rendered at 2nd terminal stations, computed at 200¢ per ton of wagon	240	267	294	327	360	400
Total charges for the 2nd and a portion of the 1st terminal service of truckage	780	834	887	954	1 020	1 100
Total charges for the 1st and 2nd terminal services of truckage	1 560	1 667	1 773	1 907	2 040	2 200

RAILWAY COMPANY

and second terminal services of trackage

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
41 $\frac{1}{10}$	3 $\frac{1}{2}$	31 $\frac{7}{10}$	31 $\frac{1}{10}$	2 $\frac{1}{2}$	21 $\frac{1}{10}$	21 $\frac{3}{10}$	21 $\frac{1}{10}$	21 $\frac{9}{10}$	1 $\frac{3}{10}$	1 $\frac{2}{10}$	1 $\frac{7}{10}$	11 $\frac{1}{10}$
9	9	9	9	9	9	9	9	9	9	9	9	9
3 $\frac{3}{4}$	3 $\frac{1}{2}$	21 $\frac{7}{10}$	2 $\frac{3}{4}$	21 $\frac{7}{10}$	2 $\frac{1}{2}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	1 $\frac{3}{8}$	1 $\frac{9}{10}$	1 $\frac{2}{10}$	1 $\frac{1}{2}$	11 $\frac{1}{10}$
7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
21 $\frac{9}{10}$	2 $\frac{1}{2}$	21 $\frac{1}{10}$	2 $\frac{3}{4}$	1 $\frac{7}{8}$	11 $\frac{1}{10}$	11 $\frac{1}{10}$	1 $\frac{3}{8}$	11 $\frac{1}{10}$	1 $\frac{3}{10}$	11 $\frac{1}{10}$	1 $\frac{9}{10}$	7 $\frac{1}{8}$
6	6	6	6	6	6	6	6	6	6	6	6	6
11 $\frac{1}{10}$	11 $\frac{3}{10}$	11 $\frac{1}{10}$	11 $\frac{7}{10}$	11 $\frac{3}{10}$	11 $\frac{1}{10}$	11 $\frac{3}{10}$	11 $\frac{1}{10}$	11 $\frac{3}{10}$	11 $\frac{1}{10}$	11 $\frac{3}{10}$	11 $\frac{1}{10}$	11 $\frac{3}{10}$
3 $\frac{3}{10}$	31 $\frac{3}{10}$	31 $\frac{1}{10}$	31 $\frac{7}{10}$	4 $\frac{1}{10}$	41 $\frac{1}{10}$	41 $\frac{7}{10}$	5 $\frac{1}{10}$	51 $\frac{3}{10}$	6 $\frac{1}{10}$	61 $\frac{1}{10}$	7 $\frac{1}{10}$	71 $\frac{3}{10}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
300	300	300	300	300	300	300	300	300	300	300	300	300
880	960	1 053	1 160	1 280	1 413	1 560	1 720	1 893	2 080	2 280	2 506	2 746
1 180	1 260	1 353	1 460	1 580	1 713	1 860	2 020	2 193	2 380	2 580	2 806	3 046
300	300	300	300	300	300	300	300	300	300	300	300	300
440	480	527	580	640	707	780	860	947	1 040	1 140	1 253	1 373
440	480	527	580	640	707	780	860	947	1 040	1 140	1 254	1 374
1 180	1 260	1 354	1 460	1 580	1 714	1 860	2 020	2 194	2 380	2 580	2 807	3 047
2 360	2 520	2 707	2 920	3 160	3 427	3 720	4 040	4 387	4 760	5 160	5 613	6 093

ton, or two-thirds of  $\cdot 300d$ , be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of railage which is rendered at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of railage, rendered in relation to live stock during a period of half a day, be  $\cdot 150d$ . per ton of load and  $\cdot 150d$  per ton of wagon, including taxes and profit. To correct the weights added for the conveyance of empties, let  $\cdot 100d$  per ton, or two-thirds of  $\cdot 150d$ , be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of railage

Let the sum chosen to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations in reference to empty wagons built to carry live stock, during a period of one day, be  $\cdot 300d$ . per ton, including taxes and profit. Since the weights of wagons carrying loads have been increased by one-half to include the conveyance of empties, the sum named is applicable to one-third of the increased weights of wagons. Instead of altering the weights, let  $\cdot 100d$  per ton, or one-third of  $\cdot 300d$ , be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations

Resulting from the employment of the sums chosen, charges for the first and second terminal services of railage, rendered in relation to live stock, are shown in Example 34 (pp 282-283).

Let the sums chosen to compute charges for that portion of the first terminal service of haulage which is performed at first terminal stations in relation to live stock, during a period of half a day, be  $\cdot 300d$ . per ton of load, and, during a period of one day,  $\cdot 600d$ . per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $\cdot 400d$  per ton, or two-thirds of  $\cdot 600d$ , be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of haulage which is performed at first terminal stations

Let the sums chosen to compute charges for the second terminal service of haulage, performed in relation to live stock during a period of half a day, be  $\cdot 300d$  per ton of load and  $\cdot 300d$  per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $\cdot 200d$  per ton, or two-thirds of  $\cdot 300d$ , be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of haulage.

Let the sum chosen to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations in relation to empty wagons built to carry live stock, during a period of one day, be  $\cdot 600d$  per ton, including profit. Since the weights

of wagons carrying loads have been increased by one-half to include the conveyance of empties, the sum mentioned is applicable to one-third of the increased weights of wagons. Instead of altering the weights, let  $\cdot 200d$  per ton, or one-third of  $600d$ , be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of haulage, performed in relation to live stock, are shown in Example 35 (pp. 284-285).

Let the sums chosen to compute charges for that portion of the first terminal service of truckage which is rendered at first terminal stations in reference to live stock, during a period of half a day, be  $\cdot 300d$  per ton of load, and, during a period of one day,  $600d$  per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $\cdot 400d$  per ton, or two-thirds of  $600d$ , be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of truckage which is rendered at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of truckage, rendered in reference to live stock during a period of half a day, be  $\cdot 300d$  per ton of load and  $300d$  per ton of wagon, including profit. To correct the weights added for the conveyance of empties, let  $\cdot 200d$  per ton, or two-thirds of  $\cdot 300d$ , be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of truckage.

Let the sum chosen to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations in reference to empty wagons built to carry live stock, during a period of one day, be  $600d$  per ton, including profit. Since the weights of wagons carrying loads have been increased by one-half to include the conveyance of empties, the sum named is applicable to one-third of the increased weights of wagons. In place of altering the weights, let  $\cdot 200d$  per ton, or one-third of  $600d$ , be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations

Resulting from the employment of the sums chosen, charges for the first and second terminal services of truckage rendered in relation to live stock, are shown in Example 36 (pp. 286-287)

Animals enter and leave wagons by means of their own powers. It is requisite, however, to employ men to count them, help to drive them in and out of the wagons or the pens, and to take note of their condition. The same individuals have to open, close, fasten, and unfasten the doors

## EXAMPLE 37

SOUTH NORTHERN

*Live stock—Charges for the first*

Nos OF GRADES	11	12	12	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons
<b>H1</b> Distinguishing weights of loads for large wagons (1)	7½	6¾	6¾	5½	5	4½
Average weights of wagons (6 tons + 3 tons for empties)	9	9	9	9	9	9
<b>H1</b> Distinguishing weights of loads for medium wagons (2)	6½	5¾	5¾	4¾	4¾	3¾
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½
<b>H1</b> Distinguishing weights of loads for small wagons (3)	5	4½	4½	3¾	3¾	3
Average weights of wagons (4 tons + 2 tons for empties)	6	6	6	6	6	6
Unit-weights of loads	1	1	1	1	1	1
Proportionate weights of wagons	1.000	1.000	1.000	1.000	1.000	2
Totals . . . . .	2.000	2.000	2.000	2.000	2.000	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st terminal service of portorage, computed at 600¢ per ton of load	600	600	600	600	600	600
And at 200¢ per ton of wagon .	240	267	293	327	360	400
Total charges for the 1st terminal service of portorage .	840	867	893	927	960	1 000
Charges for the 2nd terminal service of portorage, computed at 600¢ per ton of load .	600	600	600	600	600	600
And at 200¢ per ton of wagon	240	266	294	326	360	400
Total charges for the 2nd terminal service of portorage . . . . .	840	866	894	926	960	1 000
Total charges for the 1st and 2nd terminal services of portorage . . . . .	1 680	1 733	1 787	1 853	1 920	2 000



RAILWAY COMPANY

*and second terminal services of portage*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
4 $\frac{1}{10}$	3 $\frac{3}{4}$	3 $\frac{17}{10}$	3 $\frac{1}{10}$	2 $\frac{8}{5}$	2 $\frac{11}{10}$	2 $\frac{3}{10}$	2 $\frac{1}{10}$	1 $\frac{9}{10}$	1 $\frac{20}{10}$	1 $\frac{23}{10}$	1 $\frac{17}{10}$	1 $\frac{1}{10}$
9	9	9	9	9	9	9	9	9	9	9	9	9
3 $\frac{3}{8}$	3 $\frac{1}{2}$	2 $\frac{17}{10}$	2 $\frac{3}{5}$	2 $\frac{7}{10}$	2 $\frac{1}{5}$	1 $\frac{17}{10}$	1 $\frac{4}{5}$	1 $\frac{3}{5}$	1 $\frac{9}{10}$	1 $\frac{13}{10}$	1 $\frac{1}{5}$	1 $\frac{1}{10}$
7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
2 $\frac{2}{10}$	2 $\frac{1}{2}$	2 $\frac{11}{10}$	2 $\frac{3}{10}$	1 $\frac{7}{5}$	1 $\frac{7}{10}$	1 $\frac{11}{10}$	1 $\frac{3}{5}$	1 $\frac{11}{10}$	1 $\frac{2}{10}$	1 $\frac{1}{10}$	1 $\frac{20}{10}$	7 $\frac{1}{5}$
6	6	6	6	6	6	6	6	6	6	6	6	6
1 $\frac{9}{10}$	1 $\frac{13}{10}$	1 $\frac{13}{10}$	1 $\frac{23}{10}$	1 $\frac{37}{10}$	1 $\frac{37}{10}$	1 $\frac{37}{10}$	1 $\frac{9}{10}$	1 $\frac{23}{10}$	1 $\frac{9}{10}$	1 $\frac{21}{10}$	1 $\frac{3}{10}$	1 $\frac{37}{10}$
3 $\frac{9}{10}$	3 $\frac{3}{10}$	3 $\frac{11}{10}$	3 $\frac{7}{10}$	4 $\frac{7}{10}$	4 $\frac{11}{10}$	4 $\frac{27}{10}$	5 $\frac{9}{10}$	5 $\frac{13}{10}$	6 $\frac{9}{10}$	6 $\frac{11}{10}$	7 $\frac{3}{10}$	7 $\frac{21}{10}$
Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$
600 440	600 480	600 527	600 580	600 640	600 707	600 780	600 860	600 947	600 1 040	600 1 140	600 1 253	600 1 373
1 040	1 080	1 127	1 180	1 240	1 307	1 380	1 460	1 547	1 640	1 740	1 853	1 973
600 440	600 480	600 526	600 580	600 640	600 706	600 780	600 860	600 946	600 1 040	600 1 140	600 1 254	600 1 374
1 040	1 080	1 126	1 180	1 240	1 306	1 380	1 460	1 546	1 640	1 740	1 854	1 974
2 080	2 160	2 253	2 360	2 480	2 613	2 760	2 920	3 093	3 280	3 480	3 707	3 947

of wagons, in the process of giving ingress and egress to live stock. After the wagons have been loaded and labelled, particulars have to be supplied to invoice-clerks. On wagons being unloaded, invoices require to be checked for authentication. The floors of cattle-wagons should be swept and cleaned before being again used to receive animals. All these duties pertain to portorage. The separate weights of loads should be ascertained by means of approved machines, if possible. Failing the provision of suitable weighing-machines, and as a last resource, the persons employed to supervise loading operations should be entrusted with the task of estimating the weight of live stock contained in each wagon. To discharge this duty satisfactorily, experience and good judgment are requisite.

In calculating charges for the services of portorage performed in reference to live stock, it is expedient that the weights of wagons as well as the weights of loads should enter into the reckoning—following the course already adopted in computing charges for the same services when fulfilled in relation to general merchandise.

Let it be assumed that the first and second terminal services of portorage, performed in reference to live stock, are, reciprocally, alike in value.

Let the sums chosen to compute charges for each terminal service of portorage, performed in relation to live stock, be 600*l.* per ton of load and 300*l.* per ton of wagon carrying the load, including profit. To correct the weights added for the conveyance of empties, let 200*l.* per ton, or two-thirds of 300*l.*, be employed as a factor with the unaltered weights of wagons in computing charges for each terminal service of portorage.

Resulting from the employment of the sums chosen, charges for the first and second terminal services of portorage, performed in reference to live stock, are shown in Example 37 (pp. 290–291).

During the prevalence of cattle-plague, or foot-and-mouth disease among cattle, many years ago, the legislature enjoined railway companies to thoroughly cleanse cattle-wagons and wash the interiors with lime and water after being discharged and before being again used to carry live stock, as a preventive measure against infection, for which they were authorized to make a charge not exceeding one shilling per wagon. Let it be assumed that cattle-wagons, after being discharged, require to be disinfected in the manner described, and that the charge for the service is not to exceed one shilling per wagon.

Let the sum chosen to compute charges for disinfecting cattle-wagons be 2000*l.* per ton of wagon. This sum will apply to the weights of wagons that have carried loads, or to two-thirds of the increased weights of wagons. To correct the weights added for the conveyance of empties, let 1333*l.* ( $1\frac{1}{3}$ ), or two-thirds of 2000*l.*, be employed as a

factor with the weights of wagons to compute charges for the service of disinfection.

The next Example (Ex. 38) shows the charges, per ton of load, resulting from the employment of the sum chosen, for disinfecting wagons that have carried live stock. It will be found that the charges, applied to the weights of loads distinguishing the grades, will yield, averagely, amounts of 1s, 10d, and 8d, for the disinfection of large, medium, and small wagons, respectively.

With regard to live stock, the consecutive distances to which the scales of rates are to apply will be identical with those employed in relation to general merchandise.

Charges for the first and second terminal services of stoppage, and for the junctional services of stoppage, railage, haulage, and truckage, already calculated for general merchandise, will appropriately apply to live stock.

It is not customary for railway companies to charge for the transport of live stock ostensibly by weight. They profess to do so either by the truck, fully or less than fully loaded as the case may be, or per head. In computing the cost of conveyance and terminal services, however, regard must be paid to the widely-differing weights of animals furnishing loads, since on no other basis can any approach to equitable treatment be obtained. It may, therefore, be presumed that although railway companies do not professedly carry live stock by weight, they fix the rates and charges with some regard thereto. It is interesting to know the number of horses, cattle, sheep, and pigs, carried on railways, annually, but the information alone is not of much value. More important than numbers are the weights of animals constituting loads for wagons, and it is necessary that these should be ascertained with the object of calculating suitable rates and charges to apply to them. The weights should be entered in the invoices and form a part of the periodical returns, as with merchandise in other divisions of traffic. Also, the weights of loaded and empty cattle wagons, and the distances that they are respectively conveyed should be suitably recorded, in order that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, may be correctly ascertained. It shall be assumed that the weights of animals are obtainable, and may be entered in the invoices to form part of the accounts, and that the charges for the first and second terminal services of clerkage, already computed for general merchandise, will appropriately apply to live stock.

Although not explicitly stated, it may be presumed that the sums paid by railway companies for damage to, and loss of, goods in transport, appearing in the annual returns of the Board of Trade, include amounts paid on account of loss and damage occasioned in relation to live stock.



It shall be supposed, therefore, that the charges for risk computed for general merchandise will apply, with propriety, to live stock.

The charges for extraneous services, calculated for general merchandise, will fitly apply to live stock.

Accordingly, with reference to grades 11 to 29, inclusive, the scales of rates and the consecutive distances to which they apply, and the charges for services, liabilities, and obligations, mentioned below, calculated for general merchandise and forming a part of the illustrative Examples, will be appropriate for live stock as follows —

Scales of rates, including taxes, embracing grades	}	as in Example 11.
11 to 29, and the consecutive distances to which they are to apply,		
Charges for the first and second terminal services	}	as in Example 2
of stoppage, including taxes,		
Charges for the junctional services of stoppage,	}	as in Example 6.
railage, haulage, and truckage, including taxes,		
Charges for the first and second terminal services	}	as in Example 8
of clerkage,		
Charges for risk	.	as in Example 9.
Charges for extraneous services	.	as in Example 9.

On long journeys, the provision of water and food is requisite in order that animals may be kept in sound and merchantable condition, as well as for humane reasons. If railway companies be called on to supply water or food to live stock in the course of transport, or to fulfil any other duty, not included in the services for which charges have been calculated, the cost must be defrayed by the traders concerned.

A complete list of charges, per ton of load, stated in pence and fractions of a penny, for terminal and junctional services, liabilities, and obligations, applicable to live stock, forming the eighth division of traffic, is given in Example 39, the first of the two Examples next following. Reference to the No. of Example whence the charges have been taken is entered opposite the name of each kind of service, liability, and obligation.

Example 40 forms a complete Table (Table VIII) of Rates and Charges, per ton of load, for live stock conveyed from stations to stations in wagons provided by the railway company. It is prepared by adding, with reference to grades 11 to 29, the rates for consecutive distances, contained in Example 11, to the total charges contained in Example 39, to form scales of united rates and charges, stated in shillings and pence. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence. Opposite the successive scales of rates and charges are

*Live Stock—Charges for terminal and junctional*

Nos OF GRADES		I 1	I 2	I 3	I 4	I 5	I 6
		Tons	Tons	Tons	Tons	Tons	Tons
<b>Hi</b>	Distinguishing weights of loads for large wagons . . . . . (1)	7½	6¾	6¾	5½	5	4½
	Average weights of wagons . . . . .	6	6	6	6	6	6
	Add one-half of weights of wagons to include the weight of empty wagons conveyed . . . . .	3	3	3	3	3	3
	Total weights of wagons . . . . .	9	9	9	9	9	9
<b>Hi</b>	Distinguishing weights of loads for medium wagons . . . . . (2)	6½	5¾	5¾	4¾	4¾	3¾
	Average weights of wagons . . . . .	5	5	5	5	5	5
	Add one-half of weights of wagons to include the weight of empty wagons conveyed . . . . .	2½	2½	2½	2½	2½	2½
	Total weights of wagons . . . . .	7½	7½	7½	7½	7½	7½
<b>Hi</b>	Distinguishing weights of loads for small wagons . . . . . (3)	5	4½	4½	3¾	3¾	3
	Average weights of wagons . . . . .	4	4	4	4	4	4
	Add one-half of weights of wagons to include the weight of empty wagons conveyed . . . . .	2	2	2	2	2	2
	Total weights of wagons . . . . .	6	6	6	6	6	6
	Unit-weights of loads . . . . .	1	1	1	1	1	1
	Proportionate weights of wagons . . . . .	1¾	1¾	1¾	1¾	1¾	2
	Totals . . . . .	2¾	2¾	2¾	2¾	2¾	3
Ref to		Per ton	Per ton	Per ton	Per ton	Per ton	Per ton
the Nos		of load	of load	of load	of load	of load	of load
of		d	d	d	d	d	d
Examples							
2	Charges for the 1st and 2nd terminal services of stoppage, including taxes . . . . .	5 280	5 600	5 920	6 320	6 720	7 200
34	Charges for the 1st and 2nd terminal services of railage, including taxes . . . . .	780	833	886	953	1 020	1 100
35	Charges for the 1st and 2nd terminal services of haulage . . . . .	1 560	1 667	1 773	1 907	2 040	2 200
36	Charges for the 1st and 2nd terminal services of truckage . . . . .	1 560	1 667	1 773	1 907	2 040	2 200
	Charges for two junctional services of stoppage, including taxes . . . . .	1 056	1 120	1 184	1 264	1 344	1 440
	Charges for the junctional service of railage, including taxes . . . . .	066	070	074	079	084	090
6	Charges for the junctional service of haulage . . . . .	132	140	148	158	168	180
	Charges for the junctional service of truckage . . . . .	132	140	148	158	168	180
37	Charges for the 1st and 2nd terminal services of portage . . . . .	1 680	1 733	1 787	1 853	1 920	2 000
38	Charges for the service of disinfecting wagons . . . . .	1 600	1 777	1 955	2 177	2 400	2 667
8	Charges for the 1st and 2nd terminal services of clerage . . . . .	3 300	3 500	3 700	3 950	4 200	4 500
9	Charges for risk . . . . .	324	340	356	376	396	420
	Charges for extraneous services . . . . .	132	140	148	158	168	180
	Total charges for terminal and junctional services, liabilities, and obligations . . . . .	17 602	18 727	19 852	21 260	22 668	24 357

RAILWAY COMPANY

*services, liabilities, and obligations*

17	18	19	20	21	22	23	24	25	26	27	28	29
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$4\frac{1}{10}$	$3\frac{3}{4}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$2\frac{3}{4}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{2}{10}$	$1\frac{2}{10}$	$1\frac{1}{10}$	$1\frac{1}{10}$
6	6	6	6	6	6	6	6	6	6	6	6	6
3	3	3	3	3	3	3	3	3	3	3	3	3
9	9	9	9	9	9	9	9	9	9	9	9	9
$3\frac{3}{8}$	$3\frac{3}{8}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{1}{10}$	$1\frac{1}{10}$
5	5	5	5	5	5	5	5	5	5	5	5	5
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$
$2\frac{3}{10}$	$2\frac{1}{2}$	$2\frac{1}{10}$	$2\frac{1}{10}$	$1\frac{7}{8}$	$1\frac{7}{10}$	$1\frac{1}{10}$	$1\frac{2}{8}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{1}{8}$
4	4	4	4	4	4	4	4	4	4	4	4	4
2	2	2	2	2	2	2	2	2	2	2	2	2
6	6	6	6	6	6	6	6	6	6	6	6	6
$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{10}$	$1\frac{2}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$	$1\frac{3}{10}$
$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$5\frac{1}{10}$	$5\frac{1}{10}$	$6\frac{1}{10}$	$6\frac{1}{10}$	$7\frac{1}{10}$	$7\frac{1}{10}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
7 680	8 160	8 720	9 360	10 080	10 880	11 760	12 720	13 760	14 880	16 080	17 440	18 880
1 180	1 260	1 353	1 460	1 580	1 713	1 860	2 020	2 193	2 380	2 580	2 806	3 046
2 360	2 520	2 707	2 920	3 160	3 427	3 720	4 040	4 387	4 760	5 160	5 613	6 093
2 360	2 520	2 707	2 920	3 160	3 427	3 720	4 040	4 387	4 760	5 160	5 613	6 093
1 536	1 632	1 744	1 872	2 016	2 176	2 352	2 544	2 752	2 976	3 216	3 488	3 776
096	102	109	117	126	136	147	159	172	186	201	218	236
192	204	218	234	252	272	294	318	344	372	402	436	472
192	204	218	234	252	272	294	318	344	372	402	436	472
2 080	2 160	2 253	2 360	2 480	2 613	2 760	2 920	3 093	3 280	3 480	3 707	3 947
2 933	3 200	3 511	3 866	4 266	4 711	5 200	5 733	6 311	6 933	7 600	8 355	9 155
4 800	5 100	5 450	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900	11 800
444	468	496	528	564	604	648	696	748	804	864	932	1 004
192	204	218	234	252	272	294	318	344	372	402	436	472
26 045	27 734	29 704	31 955	34 488	37 303	40 399	43 776	47 435	51 375	55 597	60 380	65 446

## EXAMPLE 40

SOUTH NORTHERN

*Live Stock—United rates and*

NOS OF GRADES					11	12	13	14	15						
					Tons	Tons	Tons	Tons	Tons						
<b>Hi.</b> Distinguishing weights of loads for large wagons (1)					7½	6½	6¾	5½	5						
Average weights of wagons (6 tons + 3 tons for empties)					9	9	9	9	9						
<b>Hi.</b> Distinguishing weights of loads for medium wagons (2)					6½	5½	5½	4½	4¾						
Average weights of wagons (5 tons + 2½ tons for empties)					7½	7½	7½	7½	7½						
<b>Hi.</b> Distinguishing weights of loads for small wagons (3)					5	4½	4½	3¾	3½						
Average weights of wagons (4 tons + 2 tons for empties)					6	6	6	6	6						
Unit-weights of loads					1	1	1	1	1						
Proportionate weights of wagons					1¾	1¾	1¾	1¾	1¾						
Totals					2¾	2¾	2¾	2¾	2¾						
Ref to the Nos of Examples 39					Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d						
	Total charges for terminal and junctional services, liabilities, and obligations				17 602	18 727	19 852	21 260	22 668						
I	Rates for the initial distance, including taxes				66	70	74	79	84						
Rates of progression	Consecutive distances				Nos of scales										
					Scales of united rates										
1 mile	Not exceeding 1 mile				1	s	d	s	d	s	d	s	d	s	d
	Over 1 mile and not exceeding 2 miles				2	1	6	1	7	1	9	1	10	2	0
	" 2 miles " " 3 "				3	1	7	1	8	1	9	1	10	2	0
	" 3 " " " 4 "				4	1	8	1	9	1	10	2	0	2	1
	" 4 " " " 5 "				5	1	8	1	10	1	11	2	0	2	2
	" 5 " " " 6 "				6	1	9	1	10	2	0	2	1	2	3
	" 6 " " " 7 "				7	1	10	1	11	2	0	2	2	2	4
	" 7 " " " 8 "				8	1	10	2	0	2	1	2	3	2	5
	" 8 " " " 9 "				9	1	11	2	0	2	2	2	4	2	5
	" 9 " " " 10 "				10	2	0	2	1	2	3	2	4	2	6
	" 10 " " " 11 "				11	2	0	2	2	2	3	2	4	2	6
	" 11 " " " 12 "				12	2	0	2	2	2	3	2	5	2	7
	" 12 " " " 13 "				13	2	1	2	2	2	4	2	6	2	8
	" 13 " " " 14 "				14	2	2	2	3	2	5	2	7	2	9
	" 14 " " " 15 "				15	2	3	2	4	2	6	2	8	2	10
					(1) {Amounts per load}	17 6	16 4	15 11	15 2	14 7	14 7	13 7	13 3	12 8	12 2
					(2) {Amounts per load}	14 7	13 7	13 3	12 8	12 2	11 8	10 11	10 7	10 1	9 8
					(3) {Amounts per load}	11 8	10 11	10 7	10 1	9 8	8 10	7 11	7 10	6 10	6 9
2 miles	" 15 " " " 17 "				16	2	4	2	6	2	8	2	10	3	0
	" 17 " " " 19 "				18	2	5	2	7	2	9	2	11	3	2
	" 19 " " " 21 "				20	2	7	2	9	2	11	3	1	3	3
	" 21 " " " 23 "				22	2	8	2	10	3	0	3	3	3	5
	" 23 " " " 25 "				24	2	9	3	0	3	2	3	4	3	7
	" 25 " " " 27 "				26	2	11	3	1	3	3	3	6	3	9
	" 27 " " " 29 "				28	3	0	3	2	3	5	3	7	3	10
	" 29 " " " 31 "				30	3	1	3	4	3	6	3	9	4	0
	" 31 " " " 33 "				32	3	3	3	5	3	8	3	11	4	2
	" 33 " " " 35 "				34	3	4	3	7	3	9	4	0	4	3
	" 35 " " " 37 "				36	3	5	3	8	3	10	4	2	4	5
	" 37 " " " 39 "				38	3	7	3	9	4	0	4	3	4	7
	" 39 " " " 41 "				40	3	8	3	11	4	1	4	5	4	8
	" 41 " " " 43 "				42	3	9	4	0	4	3	4	6	4	10
	" 43 " " " 45 "				44	4	0	4	1	4	4	5	5	11	5



RAILWAY COMPANY

*charges for consecutive distances*

16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons $4\frac{1}{2}$ 9	Tons $4\frac{1}{2}$ 9	Tons $3\frac{3}{4}$ 9	Tons $3\frac{1}{2}$ 9	Tons $3\frac{1}{2}$ 9	Tons $2\frac{5}{8}$ 9	Tons $2\frac{1}{2}$ 9	Tons $2\frac{1}{2}$ 9	Tons $2\frac{1}{2}$ 9	Tons $1\frac{3}{4}$ 9	Tons $1\frac{3}{4}$ 9	Tons $1\frac{3}{4}$ 9	Tons $1\frac{3}{4}$ 9	Tons $1\frac{3}{4}$ 9
$3\frac{3}{4}$ $7\frac{1}{2}$	$3\frac{3}{4}$ $7\frac{1}{2}$	$3\frac{3}{4}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$	$1\frac{3}{4}$ $7\frac{1}{2}$
3 6	$2\frac{3}{4}$ 6	$2\frac{3}{4}$ 6	$2\frac{1}{2}$ 6	$2\frac{1}{2}$ 6	$1\frac{7}{8}$ 6	$1\frac{7}{8}$ 6	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6	$1\frac{1}{2}$ 6
1 2	$2\frac{3}{4}$ 2	$2\frac{3}{4}$ 2	$2\frac{3}{4}$ 2	$2\frac{3}{4}$ 2	$3\frac{1}{4}$ 2	$3\frac{1}{4}$ 2	$3\frac{1}{4}$ 2	$4\frac{1}{4}$ 2	$4\frac{1}{4}$ 2	$5\frac{1}{4}$ 2	$5\frac{1}{4}$ 2	$6\frac{1}{4}$ 2	$6\frac{1}{4}$ 2
3	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{3}{4}$	$6\frac{3}{4}$	$7\frac{3}{4}$	$7\frac{3}{4}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
24 357	26 045	27 734	29 704	31 955	34 488	37 303	40 399	43 776	47 435	51 375	55 597	60 380	65 446
90	96	102	109	117	126	136	147	159	172	186	201	218	236

and charges per ton of load

s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d
2 1	2 3	2 5	2 7	2 9	3 0	3 3	3 6	3 9	4 1	4 5	4 10	5 3	5 8	5 8
2 2	2 4	2 6	2 8	2 10	3 1	3 4	3 7	3 11	4 3	4 7	5 0	5 5	5 10	5 10
2 3	2 5	2 7	2 9	2 11	3 2	3 5	3 9	4 1	4 5	4 9	5 2	5 7	6 1	6 1
2 4	2 6	2 8	2 10	3 1	3 4	3 7	3 10	4 2	4 6	4 11	5 4	5 9	6 3	6 3
2 5	2 7	2 9	2 11	3 2	3 5	3 8	4 0	4 4	4 8	5 1	5 6	6 0	6 5	6 5
2 6	2 8	2 10	3 0	3 3	3 6	3 9	4 1	4 5	4 10	5 3	5 8	6 1	6 8	6 8
2 7	2 9	2 11	3 1	3 4	3 7	3 11	4 3	4 7	4 11	5 4	5 10	6 4	6 10	6 10
2 8	2 10	3 0	3 2	3 5	3 9	4 0	4 4	4 8	5 1	5 6	6 0	6 6	7 0	7 0
2 8	2 11	3 1	3 4	3 6	3 10	4 2	4 6	4 10	5 3	5 8	6 2	6 8	7 3	7 3
2 9	3 0	3 2	3 5	3 8	3 11	4 3	4 7	5 0	5 5	5 10	6 4	6 10	7 5	7 5
2 10	3 1	3 3	3 6	3 9	4 0	4 4	4 9	5 1	5 6	6 0	6 6	7 0	7 7	7 7
2 11	3 2	3 4	3 7	3 10	4 2	4 6	4 10	5 3	5 8	6 2	6 8	7 3	7 10	7 10
3 0	3 3	3 5	3 8	3 11	4 3	4 7	5 0	5 4	5 10	6 4	6 10	7 5	8 0	8 0
3 1	3 3	3 6	3 9	4 0	4 4	4 8	5 1	5 6	6 0	6 5	7 0	7 7	8 2	8 2
3 2	3 4	3 7	3 10	4 2	4 5	4 10	5 2	5 8	6 1	6 7	7 2	7 9	8 5	8 5
14 3	13 8	13 5	13 2	12 11	12 4	11 11	11 11	11 11	11 7	11 4	11 3	11 1	10 11	10 11
11 11	11 4	11 2	10 11	10 10	10 5	10 3	9 11	9 11	9 9	9 7	9 6	9 4	9 3	9 3
9 6	9 1	9 0	8 9	8 8	8 3	8 3	8 0	7 11	7 9	7 7	7 6	7 4	7 4	7 4
3 3	3 5	3 8	3 11	4 3	4 7	4 11	5 4	5 9	6 3	6 9	7 4	7 11	8 7	8 7
3 5	3 7	3 10	4 1	4 5	4 9	5 2	5 7	6 0	6 6	7 1	7 8	8 4	9 0	9 0
3 6	3 9	4 0	4 4	4 7	5 0	5 5	5 10	6 4	6 10	7 5	8 0	8 8	9 5	9 5
3 8	3 11	4 2	4 6	4 10	5 2	5 7	6 1	6 7	7 1	7 8	8 4	9 0	9 9	9 9
3 10	4 1	4 4	4 8	5 0	5 5	5 10	6 4	6 10	7 5	8 0	8 8	9 5	10 2	10 2
4 0	4 3	4 6	4 10	5 2	5 7	6 1	6 7	7 1	7 8	8 4	9 0	9 9	10 7	10 7
4 2	4 5	4 8	5 0	5 5	5 10	6 3	6 10	7 4	8 0	8 7	9 4	10 1	11 0	11 0
4 3	4 7	4 10	5 2	5 7	6 0	6 6	7 0	7 7	8 3	8 11	9 8	10 6	11 4	11 4
4 5	4 9	5 0	5 5	5 9	6 3	6 9	7 3	7 11	8 6	9 3	10 0	10 10	11 9	11 9
4 7	4 11	5 2	5 7	6 0	6 5	7 0	7 6	8 2	8 10	9 7	10 4	11 3	12 2	12 2
4 9	5 1	5 4	5 9	6 2	6 8	7 2	7 9	8 5	9 1	9 10	10 8	11 7	12 6	12 6
4 11	5 3	5 6	5 11	6 4	6 10	7 5	8 0	8 8	9 5	10 2	11 0	11 11	12 11	12 11
5 0	5 4	5 9	6 1	6 7	7 1	7 8	8 3	8 11	9 8	10 6	11 4	12 4	13 4	13 4
5 2	5 6	5 11	6 3	6 9	7 3	7 10	8 6	9 2	10 0	10 8	11 6	12 6	13 6	13 6

EXAMPLE 40 (continued)

Nos OF GRADES					11	12	13	14	15	
Hi. Distinguishing weights of loads for large wagons (1)					Tons	Tons	Tons	Tons	Tons	
Average weights of wagons (6 tons + 3 tons for empties)					7½	6½	6½	5½	5	
					9	9	9	9	9	
Hi. Distinguishing weights of loads for medium wagons (2)					6½	5½	5½	4½	4½	
Average weights of wagons (5 tons + 2½ tons for empties)					7½	7½	7½	7½	7½	
Hi. Distinguishing weights of loads for small wagons (3)					5	4½	4½	3½	3½	
Average weights of wagons (4 tons + 2 tons for empties)					6	6	6	6	6	
Unit-weights of loads					1	1	1	1	1	
Proportionate weights of wagons					1½	1½	1½	1½	1½	
Totals					2½	2½	2½	2½	2½	
Ref to the Nos of Examples 39					Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	
	Total charges for terminal and junctional services, liabilities, and obligations				17 602	18 727	19 852	21 260	22 668	
I	Rates for the initial distance, including taxes				66	70	74	79	84	
Rates of progression	Consecutive distances				Nos of scales		Scales of united rates			
2 miles	Over 45 miles and not exceeding 47 miles				46	s d	s d	s d	s d	s d
	" 47 " " " 49 "				48	4 0	4 3	4 6	4 10	5 1
	" 49 " " " 51 "				50	4 1	4 4	4 7	4 11	5 3
	" 51 " " " 53 "				52	4 3	4 6	4 9	5 1	5 5
	" 53 " " " 55 "				54	4 4	4 7	4 10	5 2	5 6
						4 5	4 9	5 0	5 4	5 8
	" 55 " " " 57 "				56	4 7	4 10	5 1	5 6	5 10
	" 57 " " " 59 "				58	4 8	4 11	5 3	5 7	5 11
	" 59 " " " 61 "				60	4 9	5 1	5 4	5 9	6 1
	" 61 " " " 63 "				62	4 11	5 2	5 6	5 10	6 3
	" 63 " " " 65 "				64	5 0	5 4	5 7	6 0	6 4
					(1) { Amounts per load }	37 6	36 0	34 4	33 0	31 8
					(2) { Amounts per load }	31 3	30 0	28 7	27 7	26 5
				(3) { Amounts per load }	25 0	24 0	22 11	22 1	21 1	
3 miles	" 65 " " " 68 "				67	5 2	5 6	5 9	6 2	6 7
	" 68 " " " 71 "				70	5 4	5 8	6 0	6 5	6 9
	" 71 " " " 74 "				73	5 6	5 10	6 2	6 7	7 0
	" 74 " " " 77 "				76	5 8	6 0	6 4	6 9	7 3
	" 77 " " " 80 "				79	5 10	6 2	6 6	7 0	7 5
	" 80 " " " 83 "				82	6 0	6 4	6 9	7 2	7 8
	" 83 " " " 86 "				85	6 2	6 6	6 11	7 4	7 10
	" 86 " " " 89 "				88	6 4	6 8	7 1	7 7	8 1
	" 89 " " " 92 "				91	6 6	6 10	7 3	7 9	8 3
	" 92 " " " 95 "				94	6 8	7 1	7 5	8 0	8 6
	" 95 " " " 98 "				97	6 10	7 3	7 8	8 2	8 8
	" 98 " " " 101 "				100	7 0	7 5	7 10	8 4	8 11
	" 101 " " " 104 "				103	7 2	7 7	8 0	8 7	9 1
	" 104 " " " 107 "				106	7 4	7 9	8 2	8 9	9 4
	" 107 " " " 110 "				109	7 6	7 11	8 5	8 11	9 6
	" 110 " " " 113 "				112	7 8	8 1	8 7	9 2	9 9
	" 113 " " " 116 "				115	7 10	8 3	8 9	9 4	9 11
	" 116 " " " 119 "				118	7 11	8 5	8 11	9 6	10 2
	" 119 " " " 122 "				121	8 1	8 7	9 1	9 9	10 4
	" 122 " " " 125 "				124	8 3	8 10	9 4	9 11	10 7

16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons $4\frac{1}{2}$ 9	Tons $4\frac{1}{10}$ 9	Tons $3\frac{3}{4}$ 9	Tons $3\frac{1}{2}$ 9	Tons $3\frac{1}{10}$ 9	Tons $2\frac{1}{2}$ 9	Tons $2\frac{1}{10}$ 9	Tons $2\frac{1}{10}$ 9	Tons $2\frac{1}{10}$ 9	Tons $1\frac{1}{10}$ 9	Tons $1\frac{1}{10}$ 9	Tons $1\frac{1}{10}$ 9	Tons $1\frac{1}{10}$ 9	Tons $1\frac{1}{10}$ 9
$3\frac{3}{4}$ $7\frac{1}{2}$	$3\frac{3}{4}$ $7\frac{1}{2}$	$3\frac{3}{4}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$2\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$	$1\frac{1}{2}$ $7\frac{1}{2}$
3 6	$2\frac{1}{10}$ 6	$2\frac{1}{10}$ 6	$2\frac{1}{10}$ 6	$2\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6	$1\frac{1}{10}$ 6
I 2	I $2\frac{1}{10}$	I $2\frac{1}{10}$	I $2\frac{1}{10}$	I $2\frac{1}{10}$	I $3\frac{1}{10}$	I $3\frac{1}{10}$	I $3\frac{1}{10}$	I $4\frac{1}{10}$	I $4\frac{1}{10}$	I $5\frac{1}{10}$	I $5\frac{1}{10}$	I $6\frac{1}{10}$	I $6\frac{1}{10}$
3	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$5\frac{1}{10}$	$5\frac{1}{10}$	$6\frac{1}{10}$	$6\frac{1}{10}$	$7\frac{1}{10}$	$7\frac{1}{10}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
24 357	26 045	27 734	29 704	31 955	34 488	37 303	40 399	43 776	47 435	51 375	55 597	60 380	65 446
90	96	102	109	117	126	136	147	159	172	186	201	218	236

and charges per ton of load

s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d
5 6	5 10	6 3	6 8	7 2	7 8	8 4	9 0	9 9	10 7	11 5	12 4	13 5	14 6		
5 8	6 0	6 5	6 10	7 4	7 11	8 7	9 3	10 0	10 10	11 1	12 8	13 9	14 11		
5 9	6 2	6 7	7 0	7 6	8 1	8 9	9 6	10 3	11 1	12 0	13 0	14 1	15 3		
5 11	6 4	6 9	7 2	7 9	8 4	9 0	9 9	10 6	11 5	12 4	13 4	14 6	15 8		
6 1	6 6	6 11	7 5	7 11	8 7	9 3	10 0	10 10	11 8	12 8	13 8	14 10	16 1		
6 3	6 8	7 1	7 7	8 1	8 9	9 5	10 3	11 1	12 0	13 0	14 0	15 2	16 6		
6 5	6 10	7 3	7 9	8 4	9 0	9 8	10 6	11 4	12 3	13 3	14 4	15 7	16 10		
6 6	7 0	7 5	7 11	8 6	9 2	9 11	10 9	11 7	12 7	13 7	14 8	15 11	17 3		
6 8	7 2	7 7	8 1	8 8	9 5	10 2	11 0	11 10	12 10	13 11	15 0	16 4	17 8		
6 10	7 3	7 9	8 3	8 11	9 7	10 4	11 2	12 2	13 2	14 2	15 4	16 8	18 0		
30 9	29 9	29 1	28 3	27 8	26 10	26 4	25 8	25 7	25 0	24 5	24 2	23 9	23 5		
25 8	24 8	24 3	23 6	23 2	22 6	22 0	21 6	21 4	21 1	20 7	20 4	20 0	19 10		
20 6	19 9	19 5	18 9	18 6	18 0	17 7	17 4	17 0	16 9	16 4	16 1	15 10	15 9		
7 1	7 6	8 0	8 7	9 2	9 11	10 8	11 7	12 6	13 7	14 8	15 10	17 2	18 8		
7 3	7 9	8 3	8 10	9 6	10 3	11 1	11 11	12 11	14 0	15 2	16 4	17 9	19 3		
7 6	8 0	8 6	9 1	9 9	10 6	11 5	12 4	13 4	14 5	15 7	16 10	18 4	19 10		
7 9	8 3	8 9	9 5	10 1	10 10	11 9	12 8	13 9	14 10	16 1	17 4	18 10	20 5		
7 11	8 6	9 0	9 8	10 4	11 2	12 1	13 1	14 1	15 3	16 6	17 10	19 5	21 0		
8 2	8 9	9 3	9 11	10 8	11 6	12 5	13 5	14 6	15 8	17 0	18 4	19 11	21 7		
8 5	9 0	9 6	10 2	10 11	11 10	12 9	13 9	14 11	16 2	17 5	18 10	20 6	22 1		
8 8	9 3	9 9	10 6	11 3	12 1	13 1	14 2	15 4	16 7	17 11	19 4	21 0	22 9		
8 10	9 5	10 1	10 9	11 6	12 5	13 5	14 6	15 8	17 0	18 5	19 11	21 7	23 4		
9 1	9 8	10 4	11 0	11 10	12 9	13 9	14 11	16 1	17 5	18 10	20 5	22 1	23 11		
9 4	9 11	10 7	11 3	12 1	13 1	14 1	15 3	16 6	17 10	19 4	20 11	22 8	24 6		
9 6	10 2	10 10	11 7	12 5	13 4	14 5	15 7	16 11	18 3	19 9	21 5	23 2	25 1		
9 9	10 5	11 1	11 10	12 8	13 8	14 9	16 0	17 4	18 9	20 3	21 11	23 9	25 9		
10 0	10 8	11 4	12 1	13 0	14 0	15 1	16 4	17 8	19 2	20 9	22 5	24 3	26 4		
10 2	10 11	11 7	12 5	13 3	14 4	15 6	16 9	18 1	19 7	21 2	22 11	24 10	26 11		
10 5	11 2	11 10	12 8	13 7	14 8	15 10	17 1	18 6	20 0	21 8	23 5	25 5	27 6		
10 8	11 4	12 1	12 11	13 11	14 11	16 2	17 5	18 11	20 5	22 1	23 11	25 11	28 1		
10 11	11 7	12 4	13 2	14 2	15 3	16 6	17 10	19 3	20 10	22 7	24 5	26 6	28 8		
11 1	11 10	12 7	13 6	14 6	15 7	16 10	18 2	19 8	21 4	23 0	24 11	27 0	29 3		
11 4	12 1	12 10	13 9	14 9	15 11	17 2	18 7	20 1	21 9	23 6	25 5	27 7	29 10		

## EXAMPLE 40 (continued)

Nos. OF GRADES		11	12	13	14	15
Hi. Distinguishing weights of loads for large wagons (1)		Tons	Tons	Tons	Tons	Tons
Average weights of wagons (6 tons + 3 tons for empties) .		7½	6¾	6½	5½	5
		9	9	9	9	9
Hi. Distinguishing weights of loads for medium wagons (2)		6½	5½	5½	4½	4½
Average weights of wagons (5 tons + 2½ tons for empties) .		7½	7½	7½	7½	7½
Hi. Distinguishing weights of loads for small wagons (3)		5	4½	4½	3½	3½
Average weights of wagons (4 tons + 2 tons for empties) .		6	6	6	6	6
Unit-weights of loads		1	1	1	1	1
Proportionate weights of wagons		1½	1½	1½	1½	1½
Totals .		2½	2½	2½	2½	2½
Ref to the Nos of Examples	39	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
		17 602	18 727	19 852	21 260	22 668
I Rates for the initial distance, including taxes		66	70	74	79	84

Rates of progression	Consecutive distances		Nos of scales	Scales of united rates											
				s		d		s		d		s		d	
3 miles	Over 125 miles and not exceeding 128 miles		127	s	d	s	d	s	d	s	d	s	d	s	d
	" 128 "	" 131 "	130	8	5	9	0	9	6	10	2	10	9	10	0
	" 131 "	" 134 "	133	8	7	9	2	9	8	10	4	11	0	11	0
	" 134 "	" 137 "	136	8	9	9	4	9	10	10	6	11	2	11	2
	" 137 "	" 140 "	139	8	11	9	6	10	0	10	9	11	5	11	5
			(1) Amounts per load	68	2	65	3	63	0	60	1	57	11	57	11
			(2) Amounts per load	56	9	54	5	52	6	50	3	48	4	48	4
			(3) Amounts per load	45	5	43	6	42	0	40	1	38	6	38	6
	" 140 "	" 143 "	142	9	3	9	10	10	5	11	1	11	10	11	10
	" 143 "	" 146 "	145	9	5	10	0	10	7	11	4	12	0	12	0
	" 146 "	" 149 "	148	9	7	10	2	10	9	11	6	12	3	12	3
	" 149 "	" 152 "	151	9	9	10	4	11	0	11	9	12	6	12	6
	" 152 "	" 155 "	154	9	11	10	7	11	2	11	11	12	8	12	8
	" 155 "	" 158 "	157	10	1	10	9	11	4	12	1	12	11	12	11
	" 158 "	" 161 "	160	10	3	10	11	11	6	12	4	13	1	13	1
	" 161 "	" 164 "	163	10	5	11	1	11	8	12	6	13	4	13	4
	" 164 "	" 167 "	166	10	7	11	3	11	11	12	8	13	6	13	6
	" 167 "	" 170 "	169	10	9	11	5	12	1	12	11	13	9	13	9
	" 170 "	" 173 "	172	10	11	11	7	12	3	13	1	13	11	13	11
	" 173 "	" 176 "	175	11	1	11	9	12	5	13	4	14	2	14	2
	" 176 "	" 179 "	178	11	3	11	11	12	8	13	6	14	4	14	4
	" 179 "	" 182 "	181	11	5	12	1	12	10	13	8	14	7	14	7
	" 182 "	" 185 "	184	11	7	12	4	13	0	13	11	14	9	14	9
	" 185 "	" 188 "	187	11	9	12	6	13	2	14	1	15	0	15	0
	" 188 "	" 191 "	190	11	11	12	8	13	4	14	3	15	2	15	2
	" 191 "	" 194 "	193	12	1	12	10	13	7	14	6	15	5	15	5
	" 194 "	" 197 "	196	12	3	13	0	13	9	14	8	15	7	15	7
	" 197 "	" 200 "	199	12	5	13	2	13	11	14	10	15	10	15	10
			(1) Amounts per load	93	2	88	11	85	7	81	7	79	2	79	2
			(2) Amounts per load	77	7	74	1	71	4	68	3	66	1	66	1
			(3) Amounts per load	62	1	59	3	57	1	54	6	52	8	52	8

16	17	18	19	20	21	22	23	24	25	26	27	28	29
Tons 4 $\frac{1}{2}$	Tons 4 $\frac{1}{10}$	Tons 3 $\frac{3}{4}$	Tons 3 $\frac{1}{10}$	Tons 3 $\frac{1}{10}$	Tons 2 $\frac{3}{4}$	Tons 2 $\frac{1}{10}$	Tons 2 $\frac{1}{10}$	Tons 2 $\frac{1}{10}$	Tons 1 $\frac{1}{10}$	Tons 1 $\frac{9}{10}$	Tons 1 $\frac{3}{10}$	Tons 1 $\frac{1}{10}$	Tons 1 $\frac{1}{10}$
9	9	9	9	9	9	9	9	9	9	9	9	9	9
3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	2 $\frac{1}{10}$	2 $\frac{3}{4}$	2 $\frac{1}{10}$	2 $\frac{3}{4}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{9}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{1}{10}$
7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
3	2 $\frac{9}{10}$	2 $\frac{1}{2}$	2 $\frac{1}{10}$	2 $\frac{3}{10}$	1 $\frac{7}{10}$	1 $\frac{7}{10}$	1 $\frac{1}{10}$	1 $\frac{3}{10}$	1 $\frac{1}{10}$	1 $\frac{9}{10}$	1 $\frac{1}{10}$	1 $\frac{9}{10}$	1 $\frac{3}{10}$
6	6	6	6	6	6	6	6	6	6	6	6	6	6
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2 $\frac{9}{10}$	2 $\frac{3}{10}$	2 $\frac{1}{10}$	2 $\frac{3}{10}$	3 $\frac{3}{10}$	3 $\frac{3}{10}$	3 $\frac{3}{10}$	4 $\frac{3}{10}$	4 $\frac{3}{10}$	5 $\frac{3}{10}$	5 $\frac{3}{10}$	6 $\frac{3}{10}$	6 $\frac{3}{10}$
3	3 $\frac{9}{10}$	3 $\frac{3}{10}$	3 $\frac{1}{10}$	3 $\frac{3}{10}$	4 $\frac{3}{10}$	4 $\frac{3}{10}$	4 $\frac{3}{10}$	5 $\frac{3}{10}$	5 $\frac{3}{10}$	6 $\frac{3}{10}$	6 $\frac{3}{10}$	7 $\frac{3}{10}$	7 $\frac{3}{10}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
24 357	26 045	27 734	29 704	31 955	34 488	37 303	40 399	43 776	47 435	51 375	55 597	60 380	65 446
90	96	1 02	1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18	2 36

and charges per ton of load

s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d	s d
11 7	12 4	13 1	14 0	15 1	16 3	17 6	18 11	20 6	22 2	24 0	25 11	28 1	30 5		
11 9	12 7	13 4	14 3	15 4	16 6	17 10	19 3	20 10	22 7	24 5	26 5	28 8	31 0		
12 0	12 10	13 7	14 7	15 8	16 10	18 2	19 8	21 3	23 0	24 11	26 11	29 2	31 7		
12 3	13 1	13 10	14 10	15 11	17 2	18 6	20 0	21 8	23 5	25 4	27 5	29 9	32 2		
12 5	13 3	14 2	15 1	16 3	17 6	18 10	20 5	22 1	23 11	25 10	27 11	30 3	32 9		
55 11	54 4	53 2	51 8	50 5	49 0	48 0	47 0	46 5	45 5	44 7	44 0	43 1	42 7		
46 7	45 1	44 3	43 0	42 3	41 2	40 0	39 4	38 8	38 3	37 6	37 0	36 4	36 0		
37 3	36 1	35 5	34 4	33 9	32 10	32 0	31 8	30 11	30 6	29 9	29 4	28 9	28 8		
12 8	13 6	14 5	15 4	16 6	17 9	19 2	20 9	22 6	24 4	26 3	28 5	30 10	33 5		
12 11	13 9	14 8	15 8	16 10	18 1	19 7	21 2	22 10	24 9	26 9	28 11	31 4	34 0		
13 2	14 0	14 11	15 11	17 1	18 5	19 11	21 6	23 3	25 2	27 3	29 5	31 11	34 7		
13 4	14 3	15 2	16 2	17 5	18 9	20 3	21 10	23 8	25 7	27 8	29 11	32 6	35 2		
13 7	14 6	15 5	16 6	17 8	19 1	20 7	22 3	24 1	26 0	28 2	30 5	33 0	35 9		
13 10	14 9	15 8	16 9	18 0	19 4	20 11	22 7	24 5	26 5	28 7	30 11	33 7	36 4		
14 0	15 0	15 11	17 0	18 3	19 8	21 3	23 0	24 10	26 11	29 1	31 5	34 1	36 11		
14 3	15 3	16 2	17 3	18 7	20 0	21 7	23 4	25 3	27 4	29 7	31 11	34 8	37 6		
14 6	15 5	16 5	17 7	18 10	20 4	21 11	23 8	25 8	27 9	30 0	32 5	35 2	38 1		
14 8	15 8	16 8	17 10	19 2	20 7	22 3	24 1	26 0	28 2	30 6	32 11	35 9	38 8		
14 11	15 11	16 11	18 1	19 5	20 11	22 7	24 5	26 5	28 7	30 11	33 5	36 3	39 3		
15 2	16 2	17 2	18 4	19 9	21 3	22 11	24 10	26 10	29 0	31 5	33 11	36 10	39 10		
15 5	16 5	17 5	18 8	20 0	21 7	23 3	25 2	27 3	29 6	31 10	34 5	37 4	40 6		
15 7	16 8	17 8	18 11	20 4	21 11	23 7	25 6	27 8	29 11	32 4	34 11	37 11	41 1		
15 10	16 11	17 11	19 2	20 7	22 2	24 0	25 11	28 0	30 4	32 10	35 5	38 6	41 8		
16 1	17 2	18 2	19 6	20 11	22 6	24 4	26 3	28 5	30 9	33 3	35 11	39 0	42 3		
16 3	17 4	18 6	20 0	21 2	22 10	24 8	26 8	28 10	31 2	33 9	36 5	39 7	42 10		
16 6	17 7	18 9	20 9	21 6	23 2	25 0	27 0	29 3	31 7	34 2	37 0	40 1	43 5		
16 9	17 10	19 0	20 3	21 9	23 5	25 4	27 5	29 7	32 1	34 8	37 6	40 8	44 0		
16 11	18 1	19 3	20 7	22 1	23 9	25 8	27 9	30 0	32 6	35 2	38 0	41 2	44 7		
76 2	74 2	72 2	70 6	68 6	66 6	65 5	63 10	63 0	61 9	60 8	59 10	58 8	58 0		
63 5	61 6	60 2	58 8	57 5	55 10	54 7	53 5	52 6	52 0	51 0	50 4	49 5	49 1		
50 9	49 3	48 2	46 10	45 10	44 6	43 8	43 0	42 0	41 5	40 5	39 11	39 1	39 0		

entered the consecutive distances, embracing 1 to 200 miles, to which they apply. These distances correspond with those adopted for general merchandise; the rate of progression being increased, after 15 miles, from one to two miles, and after 65 miles, from two to three miles.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be computed and entered in the manner shown in the Example

The amounts due for the transport of consignments of live stock whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will assist clerks to avoid entering wrong amounts in invoices when the circumstances are as described; and will save the labour of calculation with regard to consignments whose weights correspond with the weights of loads employed to distinguish the grades

## CHAPTER XIX

### SOUTH NORTHERN RAILWAY COMPANY

MODE OF INDICATING DISTANCES BETWEEN A GIVEN STATION OR PRIVATE SIDING AND OTHER STATIONS AND PRIVATE SIDINGS ON THE SAME RAILWAY, WITH THE NOS. OF THE SCALES OF RATES AND CHARGES FOR MERCHANDISE COMPRISED IN THE SEVERAL DIVISIONS OF TRAFFIC RESPECTIVELY APPROPRIATE FOR SUCH DISTANCES

To simplify illustration, charges, per ton of load, for risk, have been computed as if merchandise in every division of traffic were equally exposed to damage or loss happening in the course of transit. In reality, little or no risk attaches to the conveyance of merchandise comprised in some divisions of traffic. Most claims for loss or damage arise in connection with the transport of live stock and general merchandise; certain kinds of merchandise that require covers being particularly hazardous to convey. It is justifiable to separate general merchandise into subdivisions of traffic, according to the degree of liability to suffer loss incurred in conveying different kinds of it, and to compute charges for risk, applicable to each subdivision, by means of a larger sum, per ton of load, than has been used for the purpose of illustration.

If railway companies prefer to separate general merchandise, or any other part of traffic, into subdivisions, according to the degree of danger incurred in the process of transporting different kinds of it, charges, per ton of load, for risk, calculated in reference to some descriptions of merchandise that are very susceptible of damage, will have to be greatly increased, while those computed for coal and minerals, generally, must either be abolished or greatly reduced. The changes necessary can be brought about only by altering the sum, per ton of load, employed to compute charges for risk. Every alteration of charges will necessitate the establishment of a separate Table of Rates and Charges. Consequently, the subdividing of general merchandise so that charges for risk may be computed in accordance with the degree of hazard incurred in transporting the different kinds of it together forming the first and

second divisions of traffic, will render needful the preparation of a Table of Rates and Charges suitable for each subdivision.

Charges, per ton of wagon, computed to cover loss occasioned by accidents to locomotives, wagons, permanent way, etc., in the course of transport, will still be necessary, since the instruments employed in the conveyance of merchandise in every division of traffic are equally liable to sustain damage when accidents occur.

For reasons already stated, it is likely that different scales of charges for carting general merchandise will be requisite. The linking together, each with each, of large towns, small towns, populous districts, and villages, and the circumstance that carting staffs are provided at some stations and not at others, will necessitate the provision of separate Tables of Rates and Charges for transport by railway united with charges for cartage, so as to be in agreement with the existent conditions in each case. The creation of subdivisions of general merchandise will render needful a further increase of the number of Tables of Rates and Charges for transport by railway and charges for cartage, combined. Between stations that are not provided with carting staffs, the rates and charges for transport by railway only will apply. But between all stations, the rates and charges for transport by railway of every description of merchandise, apart from charges for cartage, should be clearly shown for the information of traders.

The dimensions of grades may be lessened, if judged needful. In that event, the number of grades in each Table would, of course, be increased. Also, the grades in each Table may be extended in either direction, should circumstances warrant the alteration. In that case, the weights of loads employed to distinguish the initial and final grades in each Table would be greater and less, respectively, than those used for illustration. The weight of load employed to mark the final grade for general merchandise in each of the two divisions of traffic, is one ton. In many instances, loads of general merchandise, obtained from small consignments furnished by various traders, individually weigh less than one ton. In other cases, they weigh more than one ton. In fairness to all parties concerned, the weight of load employed to distinguish the final grade for general merchandise in each of the two divisions of traffic should be the weight of load averagely obtained from small consignments.

The weights of loads employed to distinguish the grades in each Table are stated in tons and fractions of tons; each fraction of a ton consisting of cwts. or cwts and half-cwts. For the sake of facilitating computation, half a cwt. is the only fraction of a cwt. used to form a distinguishing weight of load. It would, however, be proper to employ other fractions of a cwt., and, by so doing, the resultant amounts, per distinguishing weight of load, due for each consecutive distance,



computed by means of the rates and charges, per ton of load, would gain in regularity.

The whole of merchandise is assumed to be included in eight divisions of traffic, and suitable Tables of Rates and Charges have been furnished in the form of Examples. The description of merchandise constituting these divisions, together with the symbols respectively employed to represent them and to denote the conditions of conveyance, joined with the Nos. of Examples and of Tables of Rates and Charges to which they refer, may be restated as follows :—

Ordinal Nos of the divisions of traffic	Description of merchandise constituting the eight divisions of traffic, assumed to be conveyed by the South Northern Railway Company, under stated conditions	Symbols respectively employed to represent the divisions of traffic and to denote the conditions of conveyance	Nos of Examples referring to Tables of Rates and Charges	Nos of the Tables of Rates and Charges
First	{ General merchandise carried in open wagons provided by the railway company }	<b>Ai</b>	} 12	I
Second	{ General merchandise carried in covered wagons provided by the railway company }	<b>Bi</b>		
Third	{ Articles of extraordinary weight or dimensions carried in peculiarly-constructed wagons provided by the railway company }	<b>Ci</b>	21	II
Fourth	{ Articles of great length occupying two or more wagons provided by the railway company }	<b>Di</b>	24	III
Fifth . . .	{ Coal, lime, and analogous merchandise conveyed from private sidings to stations in wagons provided by the railway company }	<b>Ei-PSi</b>	26	IV
	{ Coal, lime, and analogous merchandise conveyed from private sidings to stations in wagons provided by traders }	<b>Ei-PSi-TW</b>	29	V
Sixth	{ Merchandise, includible in other divisions of traffic, conveyed from stations to private sidings in wagons provided by traders which would otherwise be returned empty }	<b>Fi-iPS-TW</b>	31	VI
Seventh	{ Vehicles, running on their own wheels, conveyed from private sidings to private sidings }	<b>Gi-iPSi-TW</b>	33	VII
Eighth	{ Live stock carried in wagons provided by the railway company }	<b>Hi</b>	40	VIII

NOTE I.—In the absence of symbols referring to private sidings or traders' wagons, merchandise in any division of traffic is supposed to be

conveyed from stations to stations in wagons provided by the railway company.

NOTE 2—The symbols PS1 signify that merchandise is conveyed *from* private sidings to stations; 1PS, that it is conveyed from stations *to* private sidings; and 1PS1, that it is conveyed from private sidings *to* private sidings

One Table of Rates and Charges has been made to serve for general merchandise carried in open and in covered wagons, and identical weights of loads, joined with different weights of wagons, have been employed to distinguish the grades assigned to each of the two divisions of traffic. This course has been taken to simplify illustration. If it be found preferable to provide a separate Table for each division of traffic, that mode of procedure may be adopted in practice.

When Tables of Rates and Charges applicable to merchandise in the several divisions of traffic have been prepared for practical use, they should be printed and bound as books for ready reference, and be on sale to the public. Suitably joined with each Table should be a list of the kinds of merchandise, arranged in alphabetical order, to which it has reference, together with other information touching the conditions of transport which it is necessary for railway clerks and traders to know. It will then be comparatively easy for all parties concerned to ascertain the rates and charges applicable to any description of merchandise conveyed stated distances under specified conditions. Joined with Table I, the sums that require to be added to amounts computed by means of rates and charges, per ton of load, to make up the minimum charges for small consignments of general merchandise carried in open and in covered wagons, must be suitably shown, as in Example 15, for the guidance of clerks and the information of traders.

The distances between one station and other stations differ from the distances between another station and the same stations; each station in connection with other stations on the same railway having different distances. In order that clerks may be enabled to correctly invoice consignments of merchandise, it is requisite that one or more books containing the names of goods stations and private sidings, arranged in due order, should be provided at each goods station. Opposite the name of each station and private siding, on the left, should be entered the number of miles that it is distant from the station or private siding for which the book has been prepared. On the right, placed under the Nos. of the Tables to which they respectively refer, should be entered the Nos. of the Scales of United Rates and Charges, appropriate to the distance entered on the left. It must be understood that amounts, per distinguishing weight of load, due for each consecutive distance, calculated by means of the united rates and charges, per ton of load, are to be entered in the Tables of Rates and Charges established for practical

## EXAMPLE 41

## SOUTH NORTHERN RAILWAY COMPANY

*Mode of indicating the Nos of the appropriate scales of united rates and charges applicable to merchandise comprised in seven of the eight divisions of traffic when conveyed, under specified conditions, between A— station and other stations and private sidings on the South Northern Railway*

Distances Miles	Between A— station on the South Northern Railway and the following stations and private sidings on the same Railway —	Nos of Tables of Rates and Charges, and symbols, respectively, representing divisions of traffic and conditions of conveyance						
		Table I Example 12	Table II Example 21	Table III Example 24	Table IV Example 26	Table V Example 29	Table VI Example 31	Table VIII Example 40
		Ax and Bx	Cx	Dx	Ex-PSx	Ex-PSx- TW	Fx-xPS- TW	Hx
Nos of appropriate scales of united rates and charges								
10	B—	10	10	10	—	—	—	10
27½	C—	28	28	28	—	—	—	28
56½	D—	56	56	56	—	—	—	56
49½	E—	50	50	50	—	—	—	50
61	F—	60	60	60	—	—	—	60
38½	G—	38	38	38	—	—	—	38
38¾	CD private siding	—	—	—	38	36	36	—
39	EF „ „	—	—	—	38	36	36	—
94½	H—	94	94	94	—	—	—	94
122½	I—	124	124	124	—	—	—	124
138¾	J—	139	139	139	—	—	—	139
172	K—	172	172	172	—	—	—	172
13½	L—	14	14	14	—	—	—	14
31½	M—	32	32	32	—	—	—	32
31	GH private siding	—	—	—	30	28	28	—
186¾	N—	187	187	187	—	—	—	187
80¾	O—	82	82	82	—	—	—	82
140½	P—	142	142	142	—	—	—	142
71	Q—	70	70	70	—	—	—	70
35½	R—	36	36	36	—	—	—	36
36½	KL private siding	—	—	—	36	34	34	—
36½	MN „ „	—	—	—	36	34	34	—
118	S—	118	118	118	—	—	—	118
131½	T—	133	133	133	—	—	—	133
42¾	U—	42	42	42	—	—	—	42
161	V—	160	160	160	—	—	—	160
52¾	W—	52	52	52	—	—	—	52
53	OP private siding	—	—	—	52	50	50	—
53½	RS „ „	—	—	—	54	50	50	—
199½	Y—	199	199	199	—	—	—	199

## RAILWAY RATES

purposes, in the manner shown with regard to a few selected distances in the illustrative Tables.

In setting down distances between places, whether stations or private sidings, let a fraction of a quarter of a mile be called a quarter of a mile.

## EXAMPLE 42

## SOUTH NORTHERN RAILWAY COMPANY

*Mode of indicating the Nos. of the appropriate scales of united rates and charges applicable to merchandise comprised in three of the eight divisions of traffic when conveyed, under specified conditions, between AB private siding, near A—— station, and other private sidings and stations on the South Northern Railway*

Distances Miles	Between AB private siding, near A—— station, on the South Northern Railway, and the following stations and private sidings on the same Railway —	Nos. of Tables of Rates and Charges, and symbols, respectively, representing divisions of traffic and conditions of conveyance			
		Table IV (Example 26, pp. 240-245) Ex-PSr	Table V (Example 29, pp. 254-259) Ex-PSr-TW	Table VI (Example 31, pp. 265-267) Fr-rPS-TW	Table VII (Example 33, pp. 272-274) Gr-rPSr-TW
		Nos. of appropriate scales of united rates and charges			
10 $\frac{1}{4}$	B——	11	10	10	—
27 $\frac{1}{4}$	C——	28	26	26	—
56 $\frac{1}{4}$	D——	56	52	52	—
49 $\frac{1}{4}$	E——	50	46	46	—
61 $\frac{1}{4}$	F——	62	58	58	—
38 $\frac{3}{4}$	G——	38	36	36	—
39	CD private siding	—	—	—	36
39 $\frac{1}{4}$	EF " "	—	—	—	36
94 $\frac{1}{4}$	H——	94	88	88	—
122 $\frac{1}{4}$	I——	124	115	115	—
139	J——	139	130	130	—
172 $\frac{1}{4}$	K——	172	160	160	—
13 $\frac{1}{4}$	L——	14	13	13	—
31 $\frac{1}{4}$	M——	32	30	30	—
31 $\frac{1}{4}$	GH private siding	—	—	—	30
187	N——	187	175	175	—
81	O——	82	76	76	—
140 $\frac{1}{4}$	P——	142	133	133	—
71 $\frac{1}{4}$	Q——	73	67	67	—
35 $\frac{1}{4}$	R——	36	34	34	—
36 $\frac{1}{4}$	KL private siding	—	—	—	34
36 $\frac{1}{4}$	MN " "	—	—	—	34
118 $\frac{1}{4}$	S——	118	112	112	—
131 $\frac{1}{4}$	T——	133	124	124	—
43	U——	42	40	40	—
161 $\frac{1}{4}$	V——	163	151	151	—
53	W——	52	50	50	—
53 $\frac{1}{4}$	OP private siding	—	—	—	50
53 $\frac{1}{4}$	RS " "	—	—	—	50
199 $\frac{1}{4}$	Y——	199	187	187	—

Example 41, the first of the two preceding Examples, is intended to show how the Nos. of the Scales of United Rates and Charges, contained in the Tables furnished for illustration, applicable to merchandise comprised in seven of the eight divisions of traffic when conveyed under specified conditions between a given station (A—— station) and other

stations and private sidings on the same railway, may be entered in a book for the guidance of clerks in the discharge of their duties. Example 42 is designed to supply the same information with regard to merchandise comprised in three of the eight divisions of traffic when conveyed under specified conditions between a given private siding (AB private siding, near A—— station) and other private sidings and stations on the same railway. The distance between AB private siding and A—— station is assumed to be a quarter of a mile. The names of stations are entered in alphabetical order; one letter representing the name of each station. The name of each private siding is represented by two letters, bracketed with the name of the station at which an account is kept of the traffic dealt with at the private siding.

In these two Examples the Nos. of the Scales of United Rates and Charges entered opposite the name of each station and private siding, respectively, although identical when relating to Tables having the same consecutive distances, are, for the sake of clearness, entered in separate columns below the Nos of the Tables to which they individually refer. In practice, when the conditions permit, they may be entered singly in one column opposite the names of stations and private sidings for which they are respectively appropriate, the Nos. of the various Tables concerned being entered at the head of the column.

There are many railway companies in the United Kingdom, and, in numerous instances, large towns and towns of less magnitude are connected together by the systems of two or more railway companies, so that each company naturally enters into competition for the traffic passing between such towns. When two towns are connected together by two or more railways, the different routes may be expected to have different lengths. If railway companies were obliged to adhere to their normal rates in all circumstances, it is likely that competing companies whose routes were longer than other routes would cease to share in the traffic striven for, because the rates for the longer routes would probably be higher than the rates for the shortest routes, and traders would choose to have their merchandise conveyed by those companies whose rates and charges were the lowest. It would be wrong to compel railway companies to lower their rates for competitive reasons, and it would also be wrong to prohibit them from doing so if the companies were inclined to abate them. Railway companies should not be allowed to alter, exceptionally, their established rates and charges unless it can be shown that the action will not be prejudicial to traders. In the circumstances mentioned, the adoption of the lowest rates and charges by all the competing companies having the longer routes, assuming that in each case there remained a margin for profit, would be beneficial to themselves and to traders located in the towns between which competition existed, and would not be injurious to other traders.

Consequently, when two towns are connected together by two railways, the company which has the longer route, and whose normal rates may be assumed to be higher than those of the company which has the shorter route, should be allowed, if so disposed, to adopt, with regard to traffic passing between the two towns, the normal rates and charges of the company whose route is shorter. If the consecutive distances to which the scales of rates apply be not the same for each competing company, it will be necessary to supply copies of the Tables of Rates and Charges, calculated for the shorter or cheaper route, to the company whose route is longer or dearer, in order that the Nos. of the appropriate Scales of United Rates and Charges may be correctly entered, opposite the name of each station forming a terminal of the longer route, in the books of reference respectively provided at the two stations for the guidance of clerks.

## CHAPTER XX

### SOUTH NORTHERN AND WEST EASTERN RAILWAY COMPANIES CONJOINED

#### RATES AND CHARGES FOR GENERAL MERCHANDISE CARRIED IN OPEN AND IN COVERED WAGONS

IN order to serve the wants of traders in all parts of the country, many railway companies are established, each having its own sphere of operations. In numerous instances the systems of two or more companies have to be made use of to convey merchandise from one town or village to another. Differences exist in the cost of land acquired for the construction of railways, and the expense of working them, after completion, varies more or less, owing to many causes. Moreover, notwithstanding that all railways in Great Britain have the same gauge, rolling-stock intended for any division of traffic is not designed by the various railway companies so as to have one approved form of construction. Apparently, each company makes or provides rolling-stock without definite restriction as regards make, save that the distance between the wheels on each of the axles of vehicles must be in agreement with the gauge adopted for all railways. Consequently, from an economic point of view, the wagons built by one company may be better adapted for their purpose than those constructed by another company, as also may be its locomotives and other vehicles.

When traders consign merchandise to be conveyed to its destination by two railway companies in continuous succession, it is expected that the total cost of transport will be calculable by means of single sums, embodying rates and charges, per ton of load. The computation of rates and charges respectively due to two railway companies jointly undertaking the transport of merchandise, and their subsequent union so as to form Tables of Rates and Charges per ton of load, require careful attention, and, as will be seen, may be more or less difficult according to circumstances.

Let it be supposed that two railway companies, whose systems are connected by means of interjunctions, are jointly employed to convey merchandise between stations on one railway and stations on the other. Let the first company be called the South Northern Railway Company, whose rates and charges have already been calculated and set forth in Tables, illustratively, and let the second company be called the West

Eastern Railway Company, whose rates and charges have now to be calculated, and joined to the rates and charges of the first company so as to form Tables of united Rates and Charges per ton of load, for merchandise in the several divisions of traffic conveyed by the two railway companies conjointly

Let the average weight of locomotive, tender, and brake-van, forming the instruments of power, employed to convey trains on the West Eastern Railway, be 90 tons, and let the average weight of loaded and empty wagons, forming a train-load, be 150 tons. The ratio of 90 to 150 is the same as of three to five. The sum of 20*d* per ton, chosen to be employed as a factor with the whole weight of a train to calculate the cost of conveyance, including taxes and profit, needs now to be increased by three-fifths to form a factor with the weight of the train-load only, in order to compute the cost of conveying the whole train without the weight of the instruments of power appearing in the operation. Three-fifths of 20*d*. is 12*d*., and by adding the two sums together, 32*d*. is obtained, which is one-fifteenth more than 30*d* per ton. The respective sums, per ton of load and wagon, per mile, comprehending the instruments of power, to be employed to compute the cost of the interterminal services of railage, haulage, and truckage, constituting conveyance, now become altered as follows —

	PER TON PER MILE <i>d</i>	SUMS, PER TON OF LOAD AND WAGON, PER MILE <i>d</i>
Sum to compute the cost of the inter-terminal service of railage relating to loads and wagons . . . . .	080	
Add three-fifths of the above sum to compute the cost of the interterminal service of railage relating to the instruments of power . . . . .	<u>048</u>	128
Sum to compute the cost of the inter-terminal service of haulage relating to loads and wagons . . . . .	100	
Add three-fifths of the above sum to compute the cost of the interterminal service of haulage relating to the instruments of power . . . . .	<u>060</u>	160
Sum to compute the cost of the inter-terminal service of truckage relating to loads and wagons . . . . .	020	
Add three-fifths of the above sum to compute the cost of the interterminal service of truckage relating to the instruments of power . . . . .	<u>012</u>	<u>032</u>
		<u>320</u>



Instead of altering the scales of rates for conveyance which have already been calculated by means of the sum of 30¢ per ton of load and wagon, per mile, including taxes and profit, it is preferable to let them remain unchanged, and to alter, in a correspondingly needful degree, the consecutive distances to which they apply. One mile may be expressed as fifteen-fifteenths, and by adding one to the denominator it becomes fifteen-sixteenths. By employing fifteen-sixteenths of a mile as the initial distance instead of one mile, and by altering the consecutive distances so as to be multiples of it, letting the unaltered scales of rates apply in the same order as before, the result will be equivalent to raising the rates by one-fifteenth. Therefore, with regard to the West Eastern Railway Company, let the consecutive distances be multiples of fifteen-sixteenths of a mile instead of one mile, and let the unaltered scales of rates apply to them in the same order as before.

Let the subject of calculation be the rates and charges applicable to general merchandise carried in open and in covered wagons forming the first and second divisions of traffic, and let the symbols, A<sub>2</sub> and B<sub>2</sub>, respectively signify that merchandise of the kinds mentioned is conveyed between stations on the South Northern Railway and stations on the West Eastern Railway, or that transport is accomplished by two railway companies, conjointly.

Let it be assumed that the average weight of open wagon provided by the West Eastern Railway Company is five tons, and that the maximum weight of load which it is registered to carry is ten tons.

Let it be supposed that the average weight of covered wagon, whether the cover consist of one or more tarpaulins or of solid structure, is 5½ tons, and that the maximum weight of load which it is registered to carry is 10 tons.

Let it also be assumed that the average maximum weight of load obtained from consignments of general merchandise in each division of traffic that furnish full loads, is three-fourths of the potential maximum weight of load or three-fourths of the weight of load when fully occupying the loading space provided by each wagon.

For the sake of simplifying illustration, the weights and powers of wagons provided by the West Eastern Railway Company to carry general merchandise are assumed to correspond with the weights and powers of wagons provided by the South Northern Railway Company for the same purpose, and, therefore, the twenty-two weights of loads employed to distinguish the grades in reference to general merchandise comprised in the first and second divisions of traffic carried on the South Northern Railway, may with propriety be used to distinguish the grades for the same kinds of merchandise carried on the West Eastern Railway.

When wagons provided by a railway company, containing general

## EXAMPLE 43

## THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons—Grades, with distinguishing weights of wagons. Rates, per ton of load, for conveyance one mile on the South*

NOS. OF GRADES	9	10	11	12	13	14	15	16	17	18
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2</b> Distinguishing weights of loads . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½	3½
Average weights of wagons . . .	5	5	5	5	5	5	5	5	5	5
Add one-half of average weights of wagons, to include the weight of empty wagons conveyed . .	2½	2½	2½	2½	2½	2½	2½	2½	2½	2½
Total weights of wagons	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons . . .	—	5½	5½	5½	5½	5½	5½	5½	5½	5½
Add one-half of average weights of wagons, to include the weight of empty wagons conveyed . . .	—	2½	2½	2½	2½	2½	2½	2½	2½	2½
Total weights of wagons	—	8½	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . .	1	1½	1½	1½	1½	1½	1½	2	2½	2½
Totals . . .	2	2½	2½	2½	2½	2½	2½	3	3½	3½
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Rates for conveyance one mile on the South Northern Railway, or fifteen-sixteenths of a mile on the West Eastern Railway, computed at 30¢ per ton of load . .	30	30	30	30	30	30	30	30	30	30
And at 30¢ per ton of wagon . . . . .	30	33	36	40	44	49	54	60	66	72
Rates, including taxes, for conveyance initial distances on the South Northern and West Eastern Railways, respectively .	60	63	66	70	74	79	84	90	96	1 02

## EASTERN RAILWAY COMPANIES CONJOINED

*weights of loads, joined with weights of wagons Unit-weights of loads and proportionate Northern Railway on fifteen-sixteenths of a mile on the West Eastern Railway.*

19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1	—
5	5	5	5	5	5	5	5	5	5	5	5	—
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1
$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$
$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$
$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
30	30	30	30	30	30	30	30	30	30	30	30	30
79	87	96	1 06	1 17	1 29	1 42	1 56	1 71	1 88	2 06	2 25	2 45
1 09	1 17	1 26	1 36	1 47	1 59	1 72	1 86	2 01	2 18	2 36	2 55	2 75

merchandise to be forwarded, are transferred to another railway company at an interjunction, a reasonable period is allowed for the vehicles to be conveyed to their destinations, discharged, and returned to the owning company. They may be used, under specified conditions, to carry return-loads, but are not to be detained beyond a fixed time. Although this rule is obviously requisite to secure the due return of wagons to the owning companies, its effect is to increase the proportion of the number of empty wagons to the number of loaded wagons conveyed, because, after discharge at stations, the wagons are not available to receive loads to be conveyed in any direction, but only in the direction of stations on the owning companies' railways.

With reference to general merchandise carried in open and in covered wagons, and conveyed between stations on the South Northern Railway and stations on the West Eastern Railway, let it be assumed that the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, is the same as of 1 to 2, or that the weight of each loaded wagon requires to be increased by one-half to include the conveyance of empties

On the grounds supposed, when an open wagon of average weight carries the average maximum weight of load,  $7\frac{1}{2}$  tons, and the weight of the wagon, 5 tons, has been increased by one-half,  $2\frac{1}{2}$  tons, so as to amount to  $7\frac{1}{2}$  tons, the weight of wagon proportionate to unit-weight of load will be 1 ton, corresponding to grade 9. Also, when a covered wagon of average weight carries the average maximum weight of load,  $7\frac{1}{2}$  tons, and the weight of the wagon,  $5\frac{1}{2}$  tons, has been increased by one-half,  $2\frac{3}{4}$  tons, so as to amount to  $8\frac{1}{4}$  tons, the weight of wagon proportionate to unit-weight of load will be  $1\frac{3}{8}$  tons, corresponding to grade 10. To embrace the twenty-two distinguishing weights of loads carried in open wagons, beginning with  $7\frac{1}{2}$  tons and ending with 1 ton, grades 9 to 30, inclusive, will be required, and, carried in covered wagons, grades 10 to 31, inclusive, will be needed. The extension of the grades thus occasioned renders it necessary to furnish fresh Examples of Rates and Charges in order that their computation may be set forth with sufficient clearness

On pp. 316 and 317, Example 43 shows the rates, per ton of load, including taxes, for conveyance one mile on the South Northern Railway, or fifteen-sixteenths of a mile on the West Eastern Railway, the respective initial distances on the two railways.

In reference to the West Eastern Railway, let it be assumed that the average speed of trains conveying merchandise is twenty miles an hour, or one mile in three minutes.

Let it be supposed that the average weight of wagons, loaded and empty, transferred by the agency of a locomotive and its staff at each stop at a station, is 75 tons.

Let it be assumed that the average length of time required to transfer wagons, loaded and empty, at each stop at a station, is six minutes.

Let it be supposed that the value of a service of stoppage, lasting six minutes, is equivalent to the value of the interterminal services of railage, haulage, and truckage, assumed to be performed in conveying a train of average weight during a period of six minutes. The average weight of train-load has been assumed to be 150 tons, the average distance travelled by a train in six minutes to be two miles; and the sum to compute the rate for conveyance two miles to be 64*d.* per ton of load and wagon, inclusive of the instruments of power. By multiplying 150 tons by 64*d.*, the sum per ton of load and wagon for two miles, the product is 96*d.*, or 8*s.* By dividing the amount by 75 tons, the weight of loaded and empty wagons averagely transferred at each stop at a station, the quotient is 1 280*d.*, which is the sum, per ton of load and wagon, including taxes and profit, to be employed to compute charges for the first or second terminal service of stoppage, performed with regard to merchandise in every division of traffic conveyed by the West Eastern Railway Company.

The sum of 1 200*d.*, per ton of load and wagon, including taxes and profit, has been employed to compute charges for the first or second terminal service of stoppage, performed with regard to merchandise conveyed by the South Northern Railway Company. Resulting from the employment as factors of the two sums named, charges for the first and second terminal services of stoppage, performed in reference to general merchandise forming the first and second divisions of traffic when conveyed between stations on the South Northern Railway and stations on the West Eastern Railway, are shown in Example 44, pp. 322, 323

Let it be granted that the average value of land, per square yard, acquired by the West Eastern Railway Company to form stations, corresponds with that of land acquired by the South Northern Railway Company for the same purpose.

Let it be assumed that the average value of structures, turn-tables, and other instrumental requisites forming the equipment of stations on the West Eastern Railway, corresponds with the value of similar instrumental machinery provided at stations on the South Northern Railway.

Let it be supposed that the average periods of time needed by the West Eastern Railway Company to fulfil the first and second terminal services of railage, haulage, and truckage, agree with the average periods of time required by the South Northern Railway Company to render the same services. They may be restated as follows:—

For those portions of the first terminal services of railage, haulage, and truckage, which are performed at first terminal stations, one day is

required, divided thus : half a day to place empty wagons in position for loading, and half a day to load, marshal, and despatch them.

To perform the second terminal services of railage, haulage, and truckage, in relation to loaded wagons, a period of two days is averagely necessary ; the maximum period of time allowed for wagons to remain undischarged being three days.

For those portions of the first terminal services of railage, haulage, and truckage, which are fulfilled at second terminal stations solely in relation to empty wagons, one day is needed to move them from the sidings in which they stand, place them in position for departure, and despatch them. On arrival at the stations where they have to be loaded, half a day is required to place them in position for loading, and half a day to load, marshal, and despatch them.

The sums employed as factors with the weights of loads and wagons to compute charges for the first and second terminal services of railage, haulage, and truckage, performed by the South Northern Railway Company, may also be employed to compute charges for the same services when fulfilled by the West Eastern Railway Company. They are as follows —

For the first or second terminal service of railage '300*d*. per ton of load and wagon, per day.

For the first or second terminal service of haulage '600*d*. per ton of load and wagon per day

For the first or second terminal service of truckage '600*d*. per ton of load and wagon per day.

In reference to general merchandise conveyed by the said two Railway Companies conjointly, the weights of wagons have been increased by one-half to include the conveyance of empties. Charges, per ton of wagon, for the first and second terminal services of railage, haulage, and truckage, performed in regard to wagons carrying loads and wagons that stand, empty, at stations, require to be computed separately. Instead of altering the weights, it is preferable to let them remain unchanged, and to alter, in a corresponding degree, the sums, per ton of wagon, chosen to compute charges for the respective services.

Therefore, with respect to general merchandise conveyed in open and in covered wagons by the South Northern and West Eastern Railway Companies conjointly, let the sums chosen to compute charges for that portion of the first terminal service of railage which is rendered at first terminal stations during a period of half a day, be '150*d*. per ton of load, and, during a period of one day, '300*d*. per ton of wagon, including taxes and profit. To correct the weights added on account of empty wagons conveyed, let '200*d*. per ton, or two-thirds of '300*d*., be employed as a factor with the unaltered weights of wagons in computing charges for

that portion of the first terminal service of railage which is rendered at first terminal stations

Let the sums chosen to compute charges for the second terminal service of railage, rendered during a period of two days, be 600*d* per ton of load and 600*d*. per ton of wagon, including taxes and profit. To correct the weights added on account of empty wagons conveyed, let 400*d* per ton, or two-thirds of 600*d*., be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of railage

Let the sum chosen to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations in reference to empty wagons, during a period of one day, be 300*d*. per ton, including taxes and profit. The weights of wagons carrying loads have been increased by one-half to include the conveyance of empty wagons, and, therefore, the sum named is applicable to one-third of the increased weights of wagons. Instead of altering the weights, let 100*d* per ton, or one-third of 300*d*., be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of railage which is rendered at second terminal stations.

Let the sums chosen to compute charges for that portion of the first terminal service of haulage which is performed at first terminal stations during a period of half a day, be 300*d* per ton of load, and, during a period of one day, 600*d*. per ton of wagon, including profit. To correct the weights added on account of empty wagons conveyed, let 400*d* per ton, or two-thirds of 600*d*., be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of haulage which is performed at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of haulage, performed during a period of two days, be 1200*d* per ton of load and 1200*d*. per ton of wagon, including profit. To correct the weights added on account of empty wagons conveyed, let 800*d* per ton, or two-thirds of 1200*d*., be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of haulage.

Let the sum chosen to compute charges for that portion of the first terminal service of haulage which is performed at second terminal stations in reference to empty wagons, during a period of one day, be 600*d*. per ton, including profit. The weights of wagons carrying loads have been increased by one-half to include the conveyance of empty wagons, and, therefore, the sum named is applicable to one-third of the increased weights of wagons. Instead of altering the weights, let 200*d*. per ton, or one-third of 600*d*., be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first

## EXAMPLE 44

THE SOUTH NORTHERN AND WEST  
General merchandise carried in open and in covered

NOS. OF GRADES	9	10	11	12	13	14	15	16	17	18
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2.</b> Distinguishing weights of loads . . (1)	7½	6¾	6¼	5¾	5¾	4¾	4½	3¾	3¾	3¾
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads . . (2)	—	7½	6¾	6¼	5¾	5¾	4¾	4½	3¾	3¾
Average weights of wagons (5½ tons + 2¾ tons for empties)	—	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼	8¼
Unit-weights of loads	1	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . .	1	1- <sup>6</sup> / <sub>10</sub>	1- <sup>6</sup> / <sub>10</sub>	1- <sup>10</sup> / <sub>10</sub>	1- <sup>14</sup> / <sub>10</sub>	1- <sup>10</sup> / <sub>10</sub>	1- <sup>14</sup> / <sub>10</sub>	2	2- <sup>6</sup> / <sub>10</sub>	2- <sup>10</sup> / <sub>10</sub>
Totals . .	2	2- <sup>3</sup> / <sub>10</sub>	2- <sup>6</sup> / <sub>10</sub>	2- <sup>10</sup> / <sub>10</sub>	2- <sup>14</sup> / <sub>10</sub>	2- <sup>10</sup> / <sub>10</sub>	2- <sup>14</sup> / <sub>10</sub>	3	3- <sup>6</sup> / <sub>10</sub>	3- <sup>10</sup> / <sub>10</sub>
	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
Charges for the 1st or 2nd terminal service of stoppage performed by the South Northern Railway Company, computed at 1 200d per ton of load . . .	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 1 200d per ton of wagon . .	1 200	1 320	1 440	1 600	1 760	1 960	2 160	2 400	2 640	2 880
Total charges for the 1st or 2nd terminal service of stoppage due to the South Northern Railway Company . .	2 400	2 520	2 640	2 800	2 960	3 160	3 360	3 600	3 840	4 080
Charges for the 1st or 2nd terminal service of stoppage performed by the West Eastern Railway Company, computed at 1 280d per ton of load . .	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280
And at 1 280d per ton of wagon . .	1 280	1 408	1 536	1 707	1 877	2 091	2 304	2 560	2 816	3 072
Total charges for the 1st or 2nd terminal service of stoppage due to the West Eastern Railway Company . .	2 560	2 688	2 816	2 987	3 157	3 371	3 584	3 840	4 096	4 352
Total charges, including taxes, for the 1st and 2nd terminal services of stoppage performed by the South Northern and West Eastern Railway Companies, conjointly . .	4 960	5 208	5 456	5 787	6 117	6 531	6 944	7 440	7 936	8 432



## ILLUSTRATED BY EXAMPLES

323

EASTERN RAILWAY COMPANIES CONJOINED

*wagons—Charges for the first and second terminal services of stoppage.*

19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1
$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$
1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{2}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{3}{4}$	$6\frac{1}{2}$	$6\frac{3}{4}$	$7\frac{1}{2}$	$8\frac{1}{2}$
$3\frac{1}{2}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{3}{4}$	$6\frac{1}{2}$	$6\frac{3}{4}$	$7\frac{1}{2}$	$7\frac{3}{4}$	$8\frac{1}{2}$	$9\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
3 160	3 480	3 840	4 240	4 680	5 160	5 680	6 240	6 840	7 520	8 240	9 000	9 800
4 360	4 680	5 040	5 440	5 880	6 360	6 880	7 440	8 040	8 720	9 440	10 200	11 000
1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280
3 371	3 712	4 096	4 523	4 992	5 504	6 059	6 656	7 296	8 021	8 789	9 600	10 453
4 651	4 992	5 376	5 803	6 272	6 784	7 339	7 936	8 576	9 301	10 069	10 880	11 733
9 011	9 672	10 416	11 243	12 152	13 144	14 229	15 408	16 681	18 050	19 515	21 076	22 833

terminal service of haulage which is performed at second terminal stations.

Let the sums chosen to compute charges for that portion of the first terminal service of truckage which is rendered at first terminal stations during a period of half a day, be 300*d*. per ton of load, and, during a period of one day, 600*d*. per ton of wagon, including profit. To correct the weights added on account of empty wagons conveyed, let 400*d*. per ton, or two-thirds of 600*d*., be employed as a factor with the unaltered weights of wagons in computing charges for that portion of the first terminal service of truckage which is rendered at first terminal stations.

Let the sums chosen to compute charges for the second terminal service of truckage, rendered during a period of two days, be 1 200*d*. per ton of load and 1 200*d*. per ton of wagon, including profit. To correct the weights added on account of empty wagons conveyed, let 800*d*. per ton, or two-thirds of 1 200*d*., be employed as a factor with the unaltered weights of wagons in computing charges for the second terminal service of truckage.

Let the sum chosen to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations in reference to empty wagons, during a period of one day, be 600*d*. per ton, including profit. The weights of wagons carrying loads have been increased by one-half to include the conveyance of empty wagons, and, therefore, the sum named is applicable to one-third of the increased weights of wagons. Instead of altering the weights, let 200*d*. per ton, or one-third of 600*d*. be employed as a factor with the unaltered weights of wagons to compute charges for that portion of the first terminal service of truckage which is rendered at second terminal stations.

Resulting from the employment of the respective sums mentioned as factors with the weights of loads and wagons, charges for the first and second terminal services of railage, haulage, and truckage, performed by the South Northern and West Eastern Railway Companies in reference to general merchandise carried in open and in covered wagons, are separately shown in the Examples 45, 46, and 47, following.

When loaded wagons are conveyed from stations on one railway to stations on another railway, it is customary for the first company to convey them from the first terminal stations to appointed junctions, which may be called interjunctions, where the two railways meet, in order that they may be transferred either immediately, or after a short interval, to the second company, whose engines and staffs of men are subsequently employed to convey them to the second terminal stations. Interjunctions are usually in proximity to stations, and trains stop at these places for the purpose of transferring wagons that begin or end a journey as well as wagons that begin or end a part of a journey. A service of stoppage performed by one railway company may be deemed

to have the same value whether it be a terminal or an interjunctional service.

When a railway company has running powers on a section of another railway, in some cases its locomotives and staffs of men are employed to convey wagons between stations on the two railways directly, or without depositing them in sidings at interjunctions where the two railways meet. In most cases, however, each company conveys the wagons on its own section of railway, and transfers them to the other company at interjunctions; the wagons remaining in sidings for a short period before the journeys are resumed.

Let it be assumed that wagons, loaded or empty, conveyed between stations on the South Northern Railway and stations on the West Eastern Railway, are invariably transferred by one company to the other company at interjunctions.

Let the stoppage of a train to detach wagons and place them in sidings at an interjunction be called the first interjunctional service of stoppage, and let the stoppage of a train at an interjunction to attach wagons for the purpose of resuming their journeys, be called the second interjunctional service of stoppage.

In reference to general merchandise carried in open and in covered wagons, let the sum of 1'200*d*, per ton of load and wagon, including taxes and profit, be employed to compute charges for the first or second interjunctional service of stoppage performed by the South Northern Railway Company, and let the sum of 1'280*d*, per ton of load and wagon, including taxes and profit, be used to compute charges for the first or second interjunctional service of stoppage performed by the West Eastern Railway Company. These sums correspond with the sums, per ton of load and wagon, employed in Example 44 to compute charges for the first and second terminal services of stoppage performed in regard to the same kinds of merchandise conveyed by the two railway companies mentioned, conjointly. In Example 48 (pp. 332-333), therefore, the charges in Example 44 may be repeated to form charges for the first and second interjunctional services of stoppage to transfer general merchandise carried in open and in covered wagons passing between stations on the South Northern Railway and stations on the West Eastern Railway.

Let it be supposed that the average period of time during which wagons remain in sidings at an interjunction before being conveyed to second terminal stations is half a day—a quarter of a day in the sidings of the South Northern Railway Company and a quarter of a day in the sidings of the West Eastern Railway Company.

Let the interjunctional services of railage, haulage, and truckage, be respectively termed first and second interjunctional services according to the order in which they are fulfilled.

## EXAMPLE 45

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons—*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2 Distinguishing weights of loads . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
B2. Distinguishing weights of loads . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads . . .	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . . . .	1	1¾	1¾	1¾	1¾	1¾	1¾	2	2¾
Totals	2	2¾	2¾	2¾	2¾	2¾	2¾	3	3¾
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of rail- age rendered either by the South Northern or the West Eastern Railway Company, computed at 150d per ton of load . . . . .	150	150	150	150	150	150	150	150	150
And at 200d per ton of wagon . . . . .	200	220	240	267	293	327	360	400	440
Total charges for a portion of the 1st terminal service of railage rendered by the South Northern or the West Eastern Railway Company	350	370	390	417	443	477	510	550	590
Charges for the 2nd terminal service of railage rendered either by the South North- ern or the West Eastern Railway Company, com- puted at 600d per ton of load . . . . .	600	600	600	600	600	600	600	600	600
And at 400d per ton of wagon . . . . .	400	440	480	533	587	653	720	800	880
Charges for that portion of the 1st terminal service of rail- age which is rendered at 2nd terminal stations, computed at 100d per ton of wagon	100	110	120	133	147	163	180	200	220
Total charges for the 2nd and a portion of the 1st terminal service of railage rendered by the South Northern or the West Eastern Railway Company . . . . .	1 100	1 150	1 200	1 266	1 334	1 416	1 500	1 600	1 700
Total charges, including taxes, for the 1st and 2nd terminal services of railage rendered by the South Northern and the West Eastern Railway Companies, con- jointly . . . . .	1 450	1 520	1 590	1 683	1 777	1 893	2 010	2 150	2 290

# ILLUSTRATED BY EXAMPLES

327

EASTERN RAILWAY COMPANIES CONJOINED

*Charges for the first and second terminal services of railge.*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1	—
7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	—
3½	3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1
8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2½	2½	2½	3½	3½	3½	4½	4½	5½	5½	6½	6½	7½	8½
3½	3½	3½	4½	4½	4½	5½	5½	6½	6½	7½	7½	8½	9½
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
150	150	150	150	150	150	150	150	150	150	150	150	150	150
480	527	580	640	707	780	860	947	1 040	1 140	1 253	1 373	1 500	1 633
630	677	730	790	857	930	1 010	1 097	1 190	1 290	1 403	1 523	1 650	1 783
600	600	600	600	600	600	600	600	600	600	600	600	600	600
960	1 053	1 160	1 280	1 413	1 560	1 720	1 893	2 080	2 280	2 507	2 747	3 000	3 267
240	263	290	320	353	390	430	473	520	570	627	687	750	817
1 800	1 916	2 050	2 200	2 366	2 550	2 750	2 966	3 200	3 450	3 734	4 034	4 350	4 684
2 430	2 593	2 780	2 990	3 223	3 480	3 760	4 063	4 390	4 740	5 137	5 557	6 000	6 467

## EXAMPLE 46

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons—*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2</b> Distinguishing weights of loads (1)	7½	6½	6¼	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tofs + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads (2)	—	7½	6½	6¼	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads .	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons .	1	1½	1½	1½	1½	1½	1½	2	2½
Totals .	2	2½	2½	2½	2½	2½	2½	3	3½
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of haulage performed either by the South Northern or the West Eastern Railway Company, computed at 300d per ton of load	300	300	300	300	300	300	300	300	300
And at 400d per ton of wagon .	400	440	480	533	587	653	720	800	880
Total charges for a portion of the 1st terminal service of haulage performed by the South Northern or the West Eastern Railway Company	700	740	780	833	887	953	1 020	1 100	1 180
Charges for the 2nd terminal service of haulage performed either by the South Northern or the West Eastern Railway Company, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 800d per ton of wagon .	800	880	960	1 067	1 173	1 307	1 440	1 600	1 760
Charges for that portion of the 1st terminal service of haulage which is performed at 2nd terminal stations, computed at 200d per ton of wagon .	200	220	240	267	293	327	360	400	440
Total charges for the second and a portion of the 1st terminal service of haulage performed by the South Northern or the West Eastern Railway Company .	2 200	2 300	2 400	2 534	2 666	2 834	3 000	3 200	3 400
Total charges for the 1st and 2nd terminal services of haulage performed by the South Northern and the West Eastern Railway Companies, conjointly .	2 900	3 040	3 180	3 367	3 553	3 787	4 020	4 300	4 580

EASTERN RAILWAY COMPANIES CONJOINED

*Charges for the first and second terminal services of haulage*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{8}$	$1\frac{1}{10}$	1	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{1}{10}$	$3\frac{1}{8}$	$2\frac{1}{10}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{1}{10}$	$1\frac{1}{10}$	$1\frac{1}{4}$	$1\frac{1}{8}$	$1\frac{1}{10}$	$1\frac{1}{8}$	$1\frac{1}{10}$	$1\frac{1}{10}$	1
$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{3}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{3}{10}$	$4\frac{1}{10}$	$4\frac{3}{10}$	$5\frac{1}{10}$	$5\frac{3}{10}$	$6\frac{1}{10}$	$6\frac{3}{10}$	$7\frac{1}{10}$	$8\frac{1}{10}$
$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{3}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{3}{10}$	$5\frac{1}{10}$	$5\frac{3}{10}$	$6\frac{1}{10}$	$6\frac{3}{10}$	$7\frac{1}{10}$	$7\frac{3}{10}$	$8\frac{1}{10}$	$9\frac{1}{10}$
Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$	Per ton of load $d$
300	300	300	300	300	300	300	300	300	300	300	300	300	300
960	1 053	1 160	1 280	1 413	1 560	1 720	1 893	2 080	2 280	2 507	2 747	3 000	3 267
1 260	1 353	1 460	1 580	1 713	1 860	2 020	2 193	2 380	2 580	2 807	3 047	3 300	3 567
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
1 920	2 107	2 320	2 560	2 827	3 120	3 440	3 787	4 160	4 560	5 013	5 493	6 000	6 533
480	527	580	640	707	780	860	947	1 040	1 140	1 253	1 373	1 500	1 633
3 600	3 834	4 100	4 400	4 734	5 100	5 500	5 934	6 400	6 900	7 466	8 066	8 700	9 366
4 860	5 187	5 560	5 980	6 447	6 960	7 520	8 127	8 780	9 480	10 273	11 113	12 000	12 933

## EXAMPLE 47

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons—*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2. Distinguishing weights of loads . . . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
B2. Distinguishing weights of loads . . . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads .	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . . . .	1	1¾	1¾	1¾	1¾	1¾	1¾	2	2¾
Totals	2	2¾	2¾	2¾	2¾	2¾	2¾	3	3¾
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for a portion of the 1st terminal service of truckage rendered by the South Northern or the West Eastern Railway Company, computed at 300¢ per ton of load	300	300	300	300	300	300	300	300	300
And at 400¢ per ton of wagon . . . . .	400	440	480	533	587	653	720	800	880
Total charges for a portion of the 1st terminal service of truckage rendered by the South Northern or the West Eastern Railway Company	700	740	780	833	887	953	1 020	1 100	1 180
Charges for the 2nd terminal service of truckage rendered by the South Northern or the West Eastern Railway Company, computed at 1 200¢ per ton of load . . . . .	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 800¢ per ton of wagon . . . . .	800	880	960	1 067	1 173	1 307	1 440	1 600	1 760
Charges for that portion of the 1st terminal service of truckage which is rendered at 2nd terminal stations, computed at 200¢ per ton of wagon . . . . .	200	220	240	267	293	327	360	400	440
Total charges for the 2nd and a portion of the 1st terminal service of truckage rendered by the South Northern or the West Eastern Railway Company . . . . .	2 200	2 300	2 400	2 534	2 666	2 834	3 000	3 200	3 400
Total charges for the 1st and 2nd terminal services of truckage rendered by the South Northern or the West Eastern Railway Company	2 900	3 040	3 180	3 367	3 553	3 787	4 020	4 300	4 580



# ILLUSTRATED BY EXAMPLES

331

EASTERN RAILWAY COMPANIES CONJOINED

*Charges for the first and second terminal services of truckage.*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	—
7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	—
3 $\frac{1}{2}$	3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1
8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$
3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
300	300	300	300	300	300	300	300	300	300	300	300	300	300
960	1 053	1 160	1 280	1 413	1 560	1 720	1 893	2 080	2 280	2 507	2 747	3 000	3 267
1 260	1 353	1 460	1 580	1 713	1 860	2 020	2 193	2 380	2 580	2 807	3 047	3 300	3 567
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
1 920	2 107	2 320	2 560	2 827	3 120	3 440	3 787	4 160	4 560	5 013	5 493	6 000	6 533
480	527	580	640	707	780	860	947	1 040	1 140	1 253	1 373	1 500	1 633
3 600	3 834	4 100	4 400	4 734	5 100	5 500	5 934	6 400	6 900	7 466	8 066	8 700	9 366
4 860	5 187	5 560	5 980	6 447	6 960	7 520	8 127	8 780	9 480	10 273	11 113	12 000	12 933

## EXAMPLE 48

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons—*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2 Distinguishing weights of loads (1)	7½	6½	6¼	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
B2 Distinguishing weights of loads (2)	—	7½	6½	6¼	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2¼ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	1	1½	1½	1½	1½	1½	1½	2	2½
Totals	2	2½	2½	2½	2½	2½	2½	3	3½
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st or 2nd interjunctional service of stoppage performed by the South Northern Railway Company, computed at 1 200d per ton of load	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
And at 1 200d per ton of wagon	1 200	1 320	1 440	1 600	1 760	1 960	2 160	2 400	2 640
Total charges for the 1st or 2nd interjunctional service of stoppage due to the South Northern Railway Company	2 400	2 520	2 640	2 800	2 960	3 160	3 360	3 600	3 840
Charges for the 1st or 2nd interjunctional service of stoppage performed by the West Eastern Railway Company, computed at 1 280d per ton of load	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280
And at 1 280d per ton of wagon	1 280	1 408	1 536	1 707	1 877	2 091	2 304	2 560	2 816
Total charges for the 1st or 2nd interjunctional service of stoppage due to the West Eastern Railway Company	2 560	2 688	2 816	2 987	3 157	3 371	3 584	3 840	4 096
Total charges, including taxes, for the 1st and 2nd interjunctional services of stoppage performed by the South Northern and West Eastern Railway Companies, conjointly	4 960	5 208	5 456	5 787	6 117	6 531	6 944	7 440	7 936

## EASTERN RAILWAY COMPANIES CONJOINED

*Charges for the first and second interjunctional services of stoppage*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{1}{2}$	$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$
$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$	$8\frac{1}{2}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$
Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>
1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200	1 200
2 880	3 160	3 480	3 840	4 240	4 680	5 160	5 680	6 240	6 840	7 520	8 240	9 000	9 800
4 080	4 360	4 680	5 040	5 440	5 880	6 360	6 880	7 440	8 040	8 720	9 440	10 200	11 000
1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280	1 280
3 072	3 371	3 712	4 096	4 523	4 992	5 504	6 059	6 656	7 296	8 021	8 789	9 600	10 453
4 352	4 651	4 992	5 376	5 803	6 272	6 784	7 339	7 936	8 576	9 301	10 069	10 880	11 733
8 432	9 011	9 672	10 416	11 243	12 152	13 144	14 219	15 376	16 616	18 021	19 509	21 080	22 733

General merchandise carried in open and in covered wagons—Charges for

NOS OF GRADES	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2. Distinguishing weights of loads . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5 tons + 2½ tons for empties) . . .	7½	7½	7½	7½	7½	7½	7½	7½
B2. Distinguishing weights of loads . . . (2)	—	7½	6½	6½	5½	5½	4½	4½
Average weights of wagons (5½ tons + 2½ tons for empties) . . .	—	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . .	1	1⅓	1⅓	1⅓	1⅓	1⅓	1⅓	1⅓
Totals	2	2⅓	2⅓	2⅓	2⅓	2⅓	2⅓	2⅓
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st or 2nd interjunctional service of railage rendered by the South Northern Railway Company, computed at 0750d per ton of load . . .	0750	0750	0750	0750	0750	0750	0750	0750
And at 0750d per ton of wagon . . .	0750	0825	0900	1000	1100	1225	1350	
Total charges for the 1st or 2nd interjunctional service of railage due to the South Northern Railway Company . . .	1500	1575	1650	1750	1850	1975	2100	
Charges for the 1st or 2nd interjunctional service of railage rendered by the West Eastern Railway Company, computed at 0750d per ton of load . . .	0750	0750	0750	0750	0750	0750	0750	
And at 0750d per ton of wagon . . .	0750	0825	0900	1000	1100	1225	1350	
Total charges for the 1st or 2nd interjunctional service of railage due to the West Eastern Railway Company . . .	1500	1575	1650	1750	1850	1975	2100	
Total charges, including taxes, for the 1st and 2nd interjunctional services of railage rendered by the South Northern and West Eastern Railway Companies, conjointly . . .	3000	3150	3300	3500	3700	3950	4200	
Charges for the 1st or 2nd interjunctional service of haulage performed by the South Northern Railway Company, computed at 150d per ton of load . . .	150	150	150	150	150	150	150	
And at 150d per ton of wagon . . .	150	165	180	200	220	245	270	
Total charges for the 1st or 2nd interjunctional service of haulage due to the South Northern Railway Company . . .	300	315	330	350	370	395	420	450
Charges for the 1st or 2nd interjunctional service of haulage performed by the West Eastern Railway Company, computed at 150d per ton of load . . .	150	150	150	150	150	150	150	150
And at 150d per ton of wagon . . .	150	165	180	200	220	245	270	300
Total charges for the 1st or 2nd interjunctional service of haulage due to the West Eastern Railway Company . . .	300	315	330	350	370	395	420	450
Total charges for the 1st and 2nd interjunctional services of haulage performed by the South Northern and West Eastern Railway Companies, conjointly . . .	600	630	660	700	740	790	840	900
Charges for the 1st and 2nd interjunctional services of truckage rendered by the South Northern or the West Eastern Railway Company, computed at 300d per ton of load . . .	300	300	300	300	300	300	300	300
And at 300d per ton of wagon . . .	300	330	360	400	440	490	540	600
Total charges for the 1st and 2nd interjunctional services of truckage rendered by the South Northern or the West Eastern Railway Company . . .	600	630	660	700	740	790	840	900

EASTERN RAILWAY COMPANIES CONJOINED

*the first and second interjunctional services of railage, haulage, and truckage*

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons $3\frac{3}{4}$	Tons $3\frac{3}{4}$	Tons $2\frac{1}{2}$	Tons $2\frac{1}{2}$	Tons $2\frac{3}{4}$	Tons $2\frac{3}{4}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons $1\frac{1}{2}$	Tons —
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1
$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$
I $2\frac{3}{4}$	I $2\frac{3}{4}$	I $2\frac{1}{2}$	I $2\frac{1}{2}$	I $3\frac{1}{4}$	I $3\frac{1}{4}$	I $3\frac{3}{4}$	I $4\frac{1}{4}$	I $4\frac{3}{4}$	I $5\frac{1}{4}$	I $5\frac{3}{4}$	I $6\frac{1}{4}$	I $6\frac{3}{4}$	I $7\frac{1}{4}$	I $8\frac{1}{4}$
$3\frac{3}{4}$	$3\frac{3}{4}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$4\frac{1}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{4}$	$5\frac{3}{4}$	$6\frac{1}{4}$	$6\frac{3}{4}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$8\frac{1}{4}$	$9\frac{1}{4}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
0750 1650	0750 1800	0750 1975	0750 2175	0750 2400	0750 2650	0750 2925	0750 3225	0750 3550	0750 3900	0750 4275	0750 4700	0750 5150	0750 5625	0750 6125
2400	2550	2725	2925	3150	3400	3675	3975	4300	4650	5025	5450	5900	6375	6875
0750 1650	0750 1800	0750 1975	0750 2175	0750 2400	0750 2650	0750 2925	0750 3225	0750 3550	0750 3900	0750 4275	0750 4700	0750 5150	0750 5625	0750 6125
2400	2550	2725	2925	3150	3400	3675	3975	4300	4650	5025	5450	5900	6375	6875
4800	5100	5450	5850	6300	6800	7350	7950	8600	9300	10050	10900	11800	12750	13750
150 330	150 360	150 395	150 435	150 480	150 530	150 585	150 645	150 710	150 780	150 855	150 940	150 1030	150 1125	150 1225
480	510	545	585	630	680	735	795	860	930	1005	1090	1180	1275	1375
150 330	150 360	150 395	150 435	150 480	150 530	150 585	150 645	150 710	150 780	150 855	150 940	150 1030	150 1125	150 1225
480	510	545	585	630	680	735	795	860	930	1005	1090	1180	1275	1375
960	1020	1090	1170	1260	1360	1470	1590	1720	1860	2010	2180	2360	2550	2750
300 660	300 720	300 790	300 870	300 960	300 1060	300 1170	300 1290	300 1420	300 1560	300 1710	300 1880	300 2060	300 2250	300 2450
960	1020	1090	1170	1260	1360	1470	1590	1720	1860	2010	2180	2360	2550	2750

Let the sum chosen to compute charges for the first or second interjunctional service of railage rendered during a quarter of a day by either of the two railway companies mentioned, be 0750*l.* per ton of load and wagon, including taxes and profit

Let the sum chosen to compute charges for the first or second interjunctional service of haulage performed during a quarter of a day by either of the two railway companies mentioned, be 150*l.* per ton of load and wagon, including profit.

Let the sum chosen to compute charges for the first and second interjunctional services of truckage rendered during half a day by whichever of the two railway companies mentioned provides wagons, be 300*l.* per ton of load and wagon, including profit.

Resulting from the employment of the respective sums mentioned, charges for the first and second interjunctional services of railage, haulage, and truckage, performed, jointly or singly, by the South Northern and West Eastern Railway Companies in reference to general merchandise carried in open and in covered wagons, are shown in Example 49 (pp. 334-335).

In addition to the interjunctional services of stoppage, railage, haulage, and truckage, fulfilled in regard to merchandise conveyed between stations on different railways, junctional services of the same denomination are also performed in reference to a part of the traffic. In some instances, wagons are conveyed from first terminal stations to interjunctions by two or more stages, and from interjunctions to second terminal stations by two or more stages. In other cases, wagons are conveyed to and from the interjunctions directly, or without being placed, temporarily, in sidings at junctions or other intermediate places of transfer.

With reference to the South Northern and West Eastern Railway Companies conjoined, let the total weight of loaded and empty wagons conveyed by more than two stages between first terminal stations and interjunctions and between interjunctions and second terminal stations, be increased in the manner shown in Chapter V, so that when added to the weight of loaded and empty wagons conveyed by two stages between the places named, the total weight shall be equivalent to a weight of loaded and empty wagons conveyed on each of the two railways by two stages only, excluding stoppages at interjunctions. Let it be supposed that the weight thus obtained is equal to one-fifth or two-tenths of the total weight of loaded and empty wagons conveyed by the two railway companies, conjointly.

Let the stoppage of a train to transfer wagons at a junction be deemed to be equal in value to the stoppage of a train at a terminal station, both places being on the same railway.

Charges for two junctional services of stoppage performed by the South Northern Railway Company and for two junctional services of

stoppage performed by the West Eastern Railway Company are to be apportioned to the total weight of loaded and empty wagons conveyed between stations on the two railways, although they are assumed to be incurred in relation to one-fifth only of that weight, taking both railways into account

The sum chosen to compute charges, including taxes and profit, for one terminal service of stoppage performed by the South Northern Railway Company is 1 200*d.* per ton of load and wagon, and for two services, 2 400*d.* per ton of load and wagon. The sum chosen to compute charges, including taxes and profit, for one terminal service of stoppage performed by the West Eastern Railway Company is 1 280*d.* per ton of load and wagon, and for two services, 2 560*d.* per ton of load and wagon. Instead of reducing the weights of loads and wagons by four-fifths or eight-tenths, it is preferable to alter, in a corresponding degree, the respective sums to be employed as factors with the weights. Therefore, let 240*d.*, or one-tenth of 2 400*d.*, and 256*d.*, or one-tenth of 2 560*d.*, be respectively employed as factors with the unaltered weights of loads and wagons to calculate charges, including taxes and profit, applicable to merchandise in every division of traffic, for two junctional services of stoppage performed by the South Northern Railway Company, and two junctional services of stoppage performed by the West Eastern Railway Company, in relation to merchandise conveyed by the two railway companies conjointly.

Let it be supposed that the average length of time that wagons remain in sidings at junctions and other intermediate places of transfer, awaiting removal, is half a day.

Let it be assumed that the junctional services of railage, haulage, and truckage, in proportion to the length of time during which they are fulfilled, are respectively equal in value to the terminal services of railage, haulage, and truckage. The sums that have been chosen to compute charges, including taxes and profit, for the last-named services are as follows :—

Terminal service of railage 300*d.* per ton of load and wagon, per day.

Terminal service of haulage 600*d.* per ton of load and wagon, per day.

Terminal service of truckage 600*d.* per ton of load and wagon, per day.

The sums, therefore, to compute charges, including taxes and profit, for junctional services of the same denomination, fulfilled in regard to one-fifth or two-tenths of the total weight of loads and wagons during half a day, will be as follows .—

Junctional service of railage 150*d.* per ton of load and wagon.

Junctional service of haulage 300*d.* per ton of load and wagon.

Junctional service of truckage 300*d.* per ton of load and wagon.

## EXAMPLE 50

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2</b> Distinguishing weights of loads . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons.	1	1.½	1.½	1.½	1.½	1.½	1.½	2	2.½
Totals .	2	2.½	2.½	2.½	2.½	2.½	2.½	3	3.½
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for two junctional services of stoppage performed by the South Northern Railway Company, computed at 240d per ton of load . . . . .	240	240	240	240	240	240	240	240	240
And at 240d per ton of wagon . . . . .	240	264	288	320	352	392	432	480	528
Total charges for two junctional services of stoppage due to the South Northern Railway Company . . . . .	480	504	528	560	592	632	672	720	768
Charges for two junctional services of stoppage performed by the West Eastern Railway Company, computed at 2560d per ton of load . . . . .	2560	2560	2560	2560	2560	2560	2560	2560	2560
And at 2560d per ton of wagon . . . . .	2560	2816	3072	3413	3755	4182	4608	5120	5632
Total charges for two junctional services of stoppage due to the West Eastern Railway Company . . . . .	5120	5376	5632	5973	6315	6742	7168	7680	8192
(Or say) . . . . .	512	538	563	597	632	674	717	768	819
Total charges, including taxes, for four junctional services of stoppage performed by the South Northern and the West Eastern Railway Companies, conjointly . . . . .	992	1 042	1 091	1 157	1 224	1 306	1 389	1 488	1 587



EASTERN RAILWAY COMPANIES, CONJOINED

—Charges for two interjunctonal services of stoppage

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1	—
7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	—
3½	3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1
8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2½	2½	2½	3½	3½	3½	4½	4½	5½	5½	6½	6½	7½	8½
3½	3½	3½	4½	4½	4½	5½	5½	6½	6½	7½	7½	8½	9½
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
240	240	240	240	240	240	240	240	240	240	240	240	240	240
576	632	696	768	848	936	1 032	1 136	1 248	1 368	1 504	1 648	1 800	1 960
816	872	936	1 008	1 088	1 176	1 272	1 376	1 488	1 608	1 744	1 888	2 040	2 200
2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560	2560
6144	6741	7424	8192	9045	9984	1 1008	1 2117	1 3312	1 4592	1 6043	1 7579	1 9200	2 0907
8704	9301	9984	1 0752	1 1605	1 2544	1 3568	1 4677	1 5872	1 7152	1 8603	2 0139	2 1760	2 3467
870	930	998	1 075	1 161	1 254	1 357	1 468	1 587	1 715	1 860	2 014	2 176	2 347
1 686	1 802	1 934	2 083	2 249	2 430	2 629	2 844	3 075	3 323	3 604	3 902	4 216	4 547

EXAMPLE 51

THE SOUTH NORTHERN AND WEST

General merchandise carried in open and in covered wagons—Charges

NOS OF GRADES	9	10	11	12	13	14	15	16
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2. Distinguishing weights of loads . . . (1)	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{5}{8}$	5 $\frac{1}{2}$	4 $\frac{5}{8}$	4 $\frac{1}{2}$	3 $\frac{1}{2}$
Average weights of wagons (5 tons + 2 $\frac{1}{2}$ tons for empties) . . .	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$
B2. Distinguishing weights of loads . . . (2)	—	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{4}$	5 $\frac{3}{4}$	5 $\frac{1}{2}$	4 $\frac{5}{8}$	4 $\frac{1}{2}$
Average weights of wagons (5 $\frac{1}{2}$ tons + 2 $\frac{1}{2}$ tons for empties) . . .	—	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$
Unit-weights of loads . . .	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . .	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$	1 $\frac{3}{10}$
Totals . . .	2	2 $\frac{3}{10}$	2 $\frac{9}{10}$	2 $\frac{10}{10}$	2 $\frac{10}{10}$	2 $\frac{10}{10}$	2 $\frac{10}{10}$	3
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the junctional service of railage rendered by the South Northern Railway Company, computed at 0150d per ton of load . . .	0150	0150	0150	0150	0150	0150	0150	0150
And at 0150d per ton of wagon . . .	0150	0165	0180	0200	0220	0245	0270	0300
Total charges for the junctional service of railage due to the South Northern Railway Company . . .	0300	0315	0330	0350	0370	0395	0420	0450
Charges for the junctional service of railage rendered by the West Eastern Railway Company, computed at 0150d per ton of load . . .	0150	0150	0150	0150	0150	0150	0150	0150
And at 0150d per ton of wagon . . .	0150	0165	0180	0200	0220	0245	0270	0300
Total charges for the junctional service of railage due to the West Eastern Railway Company . . .	0300	0315	0330	0350	0370	0395	0420	0450
Total charges, including taxes, for the junctional services of railage rendered by the South Northern and the West Eastern Railway Companies conjointly . . .	060	063	066	070	074	079	084	090
Charges for the junctional service of haulage performed by the South Northern Railway Company, computed at 030d per ton of load . . .	030	030	030	030	030	030	030	030
And at 030d per ton of wagon . . .	030	033	036	040	044	049	054	060
Total charges for the junctional service of haulage due to the South Northern Railway Company . . .	060	063	066	070	074	079	084	090
Charges for the junctional service of haulage performed by the West Eastern Railway Company, computed at 030d per ton of load . . .	030	030	030	030	030	030	030	030
And at 030d per ton of wagon . . .	030	033	036	040	044	049	054	060
Total charges for the junctional service of haulage due to the West Eastern Railway Company . . .	060	063	066	070	074	079	084	090
Total charges for the junctional services of haulage performed by the South Northern and the West Eastern Railway Companies, conjointly . . .	120	126	132	140	148	158	168	180
Charges for the junctional services of truckage rendered by the South Northern or the West Eastern Railway Company, computed at 060d per ton of load . . .	060	060	060	060	060	060	060	060
And at 060d per ton of wagon . . .	060	066	072	080	088	098	108	120
Total charges for the junctional services of truckage rendered by the South Northern or the West Eastern Railway Company . . .	120	126	132	140	148	158	168	180

## ILLUSTRATED BY EXAMPLES

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EASTERN RAILWAY COMPANIES CONJOINED

*for the junctional services of railge, haulage, and truckage*

17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons 3 <sup>0</sup> / <sub>10</sub>	Tons 3 <sup>3</sup> / <sub>8</sub>	Tons 2 <sup>1</sup> / <sub>10</sub>	Tons 2 <sup>3</sup> / <sub>8</sub>	Tons 2 <sup>3</sup> / <sub>8</sub>	Tons 2 <sup>3</sup> / <sub>10</sub>	Tons 1 <sup>1</sup> / <sub>10</sub>	Tons 1 <sup>1</sup> / <sub>10</sub>	Tons 1 <sup>3</sup> / <sub>8</sub>	Tons 1 <sup>3</sup> / <sub>10</sub>	Tons 1 <sup>3</sup> / <sub>10</sub>	Tons 1 <sup>3</sup> / <sub>10</sub>	Tons 1 <sup>3</sup> / <sub>10</sub>	Tons 1 <sup>3</sup> / <sub>10</sub>	Tons —
7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	7 <sup>1</sup> / <sub>2</sub>	—
3 <sup>4</sup> / <sub>5</sub>	3 <sup>4</sup> / <sub>5</sub>	3 <sup>8</sup> / <sub>5</sub>	2 <sup>1</sup> / <sub>10</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>8</sub>	2 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1 <sup>3</sup> / <sub>10</sub>	1
8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>	8 <sup>1</sup> / <sub>2</sub>
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 <sup>6</sup> / <sub>10</sub>	2 <sup>1</sup> / <sub>10</sub>	2 <sup>1</sup> / <sub>10</sub>	2 <sup>3</sup> / <sub>10</sub>	3 <sup>6</sup> / <sub>10</sub>	3 <sup>1</sup> / <sub>10</sub>	3 <sup>2</sup> / <sub>10</sub>	4 <sup>0</sup> / <sub>10</sub>	4 <sup>2</sup> / <sub>10</sub>	5 <sup>0</sup> / <sub>10</sub>	5 <sup>3</sup> / <sub>10</sub>	6 <sup>3</sup> / <sub>10</sub>	6 <sup>3</sup> / <sub>10</sub>	7 <sup>1</sup> / <sub>10</sub>	8 <sup>5</sup> / <sub>10</sub>
3 <sup>0</sup> / <sub>10</sub>	3 <sup>1</sup> / <sub>10</sub>	3 <sup>1</sup> / <sub>10</sub>	3 <sup>1</sup> / <sub>10</sub>	4 <sup>0</sup> / <sub>10</sub>	4 <sup>1</sup> / <sub>10</sub>	4 <sup>1</sup> / <sub>10</sub>	5 <sup>1</sup> / <sub>10</sub>	5 <sup>2</sup> / <sub>10</sub>	6 <sup>1</sup> / <sub>10</sub>	6 <sup>3</sup> / <sub>10</sub>	7 <sup>1</sup> / <sub>10</sub>	7 <sup>1</sup> / <sub>10</sub>	8 <sup>1</sup> / <sub>10</sub>	9 <sup>2</sup> / <sub>10</sub>
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
0150 0330	0150 0360	0150 0395	0150 0435	0150 0480	0150 0530	0150 0585	0150 0645	0150 0710	0150 0780	0150 0855	0150 0940	0150 1030	0150 1125	0150 1225
0480	0510	0545	0585	0630	0680	0735	0795	0860	0930	1005	1090	1180	1275	1375
0150 0330	0150 0360	0150 0395	0150 0435	0150 0480	0150 0530	0150 0585	0150 0645	0150 0710	0150 0780	0150 0855	0150 0940	0150 1030	0150 1125	0150 1225
0480	0510	0545	0585	0630	0680	0735	0795	0860	0930	1005	1090	1180	1275	1375
096	102	109	117	126	136	147	159	172	186	201	218	236	255	275
030 066	030 072	030 079	030 087	030 096	030 106	030 117	030 129	030 142	030 156	030 171	030 188	030 206	030 225	030 245
096	102	109	117	126	136	147	159	172	186	201	218	236	255	275
030 066	030 072	030 079	030 087	030 096	030 106	030 117	030 129	030 142	030 156	030 171	030 188	030 206	030 225	030 245
096	102	109	117	126	136	147	159	172	186	201	218	236	255	275
192	204	218	234	252	272	294	318	344	372	402	436	472	510	550
060 132	060 144	060 158	060 174	060 192	060 212	060 234	060 258	060 284	060 312	060 342	060 376	060 412	060 450	060 490
192	204	218	234	252	272	294	318	344	372	402	436	472	510	550

Instead of reducing the weights of loads and wagons by four-fifths or eight-tenths for the purpose of apportioning the charges, it will be more convenient to let the weights remain unaltered, and to lessen, in a corresponding degree, the sums to be employed as factors with the weights. Accordingly, the sums to be used as factors with the unaltered weights of loads and wagons in order to compute charges, including taxes and profit, applicable to merchandise in every division of traffic for the junctional services of railage and haulage fulfilled by the South Northern and West Eastern Railway Companies, respectively, will be one-tenth of each of the sums mentioned, stated as follows —

Junctional service of railage rendered by	}	0150d	per ton of load
the South Northern Railway Company			
Junctional service of railage rendered by	}	0150d.	per ton of load
the West Eastern Railway Company			

Total 0300d

Junctional service of haulage performed by	}	030d	per ton of load
the South Northern Railway Company			
Junctional service of haulage performed by	}	030d	per ton of load
the West Eastern Railway Company			

Total 060d

Whichever company provides wagons, the whole of the service of truckage will be rendered by that company. Therefore, the sum to be employed as a factor with the unaltered weights of loads and wagons to compute charges applicable to merchandise in every division of traffic, for the junctional service of truckage rendered by the South Northern or the West Eastern Railway Company, will be one-fifth of the sum named, stated as follows —

Junctional service of truckage rendered by	}	060d	per ton of load	
the South Northern or the West Eastern				and wagon
Railway Company				

Resulting from the employment of the respective sums mentioned, charges for four junctional services of stoppage, and for the junctional services of railage, haulage, and truckage, relating to general merchandise conveyed in open and in covered wagons by the South Northern and West Eastern Railway Companies, conjointly, are shown in Examples 50 and 51 (pp. 338-341)

With regard to general merchandise conveyed in open and in covered wagons by the South Northern and the West Eastern Railway Companies, conjointly, let the sums chosen to compute charges, inclusive

of profit, for each terminal service of portorage be 3'000*l.* per ton of load and 1'500*l.* per ton of wagon carrying the load. The weights of wagons have been increased by one-half to include the conveyance of empties. To correct the weight added on account of empty wagons, let 1'000*l.*, or two-thirds of 1'500*l.*, be employed as a factor with the unaltered weights of wagons in computing charges for each terminal service of portorage.

Let the sum chosen to compute charges, inclusive of profit, for each terminal service of clerkage be 750*l.* per ton of load and wagon, including the weight of empty wagons conveyed.

The above-mentioned sums correspond with those chosen to compute charges for the first and second terminal services of portorage and clerkage performed with regard to general merchandise conveyed in open and in covered wagons by the South Northern Railway Company.

With regard to traffic shared by two railway companies, each company may be expected to include, in its returns to the Board of Trade, the weight of merchandise carried on its own system. Therefore—

Let the charges for risk, to which each of the two railway companies is entitled, be computed at 180*l.* per ton of load and 120*l.* per ton of wagon, including the weight of empty wagons conveyed.

Let the charges for extraneous services, to which each of the two railway companies is entitled, be computed at 60*l.* per ton of load and wagon, including the weight of empty wagons conveyed.

Resulting from the employment of the respective sums mentioned, charges for the first and second terminal services of portorage and clerkage, and for risk and extraneous services, relating to general merchandise conveyed in open and in covered wagons by the South Northern and the West Eastern Railway Companies, conjointly, are shown in Examples 52, 53, 54, and 55 following.

The object of the illustrations is to show the sums constituting rates and charges, per ton of load, that are to be paid by the trader. It is, however, needful that the rates and charges due to each of two railway companies, jointly engaged in the transport of merchandise, should be indicated also; and in the preceding Examples the necessary distinctions have been made.

With regard to the terminal services of railage and haulage, the amount due to each of the two railway companies will vary, according as the services are fulfilled at first or second terminal stations; the successive services being unequal in extent and value.

It is to be noted that the railway company which provides wagons renders the following services of truckage —

The interterminal service of truckage relating to loads and wagons.

That part of any service of stoppage which consists of truckage relating to loads and wagons.

## EXAMPLE 52

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons—*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2.</b> Distinguishing weights of loads . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . .	1	1.50	1.50	1.50	1.50	1.50	1.50	2	2.50
Totals . . .	2	2.50	2.50	2.50	2.50	2.50	2.50	3	3.50
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st or 2nd terminal service of portage performed by the South Northern Railway Company, computed at 3 000¢ per ton of load . . .	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
And at 1 000¢ per ton of wagon . . .	1 000	1 100	1 200	1 333	1 466	1 633	1 800	2 000	2 200
Total charges for the 1st or 2nd terminal service of portage performed by the South Northern Railway Company . . .	4 000	4 100	4 200	4 333	4 466	4 633	4 800	5 000	5 200
Charges for the 1st or 2nd terminal service of portage performed by the West Eastern Railway Company, computed at 3 000¢ per ton of load . . .	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
And at 1 000¢ per ton of wagon . . .	1 000	1 100	1 200	1 333	1 466	1 633	1 800	2 000	2 200
Total charges for the 1st or 2nd terminal service of portage performed by the West Eastern Railway Company . . .	4 000	4 100	4 200	4 333	4 466	4 633	4 800	5 000	5 200
Total charges for the 1st and 2nd terminal services of portage performed by the South Northern and the West Eastern Railway Companies, conjointly . .	8 000	8 200	8 400	8 666	8 932	9 266	9 600	10 000	10 400

## EASTERN RAILWAY COMPANIES CONJOINED

*Charges for the first and second terminal services of portorage*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{2}{3}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	—
7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{1}{2}$	—
3 $\frac{1}{2}$	3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{2}{3}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1
8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$	8 $\frac{1}{4}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$
3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$	7 $\frac{3}{4}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$
Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
2 400	2 633	2 900	3 200	3 533	3 900	4 300	4 733	5 200	5 700	6 266	6 866	7 500	8 166
5 400	5 633	5 900	6 200	6 533	6 900	7 300	7 733	8 200	8 700	9 266	9 866	10 500	11 166
3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000	3 000
2 400	2 633	2 900	3 200	3 533	3 900	4 300	4 733	5 200	5 700	6 266	6 866	7 500	8 166
5 400	5 633	5 900	6 200	6 533	6 900	7 300	7 733	8 200	8 700	9 266	9 866	10 500	11 166
10 800	11 266	11 800	12 400	13 066	13 800	14 600	15 466	16 400	17 400	18 532	19 732	21 000	22 332

## EXAMPLE 53

THE SOUTH NORTHERN AND WEST

*General merchandise carried in open and in covered wagons*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2.</b> Distinguishing weights of loads . . . . . (1)	7½	6¾	6½	5¾	5½	4¾	4½	3¾	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads . . . . . (2)	—	7½	6¾	6½	5¾	5½	4¾	4½	3¾
Average weights of wagons (5½ tons + 2¼ tons for empties) . . . . .	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . . . .	1	1¾	1¾	1¾	1¾	1¾	1¾	2	2¾
Totals . . . . .	2	2¾	2¾	2¾	2¾	2¾	2¾	3	3¾
	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
Charges for the 1st or 2nd terminal service of clerkage performed by the South Northern Railway Company, computed at 750¢ per ton of load . . . . .	750	750	750	750	750	750	750	750	750
And at 750¢ per ton of wagon	750	825	900	1 000	1 100	1 225	1 350	1 500	1 650
Total charges for the 1st or 2nd terminal service of clerkage performed by the South Northern Railway Company . . . . .	1 500	1 575	1 650	1 750	1 850	1 975	2 100	2 250	2 400
Charges for the 1st or 2nd terminal service of clerkage performed by the West Eastern Railway Company, computed at 750¢ per ton of load . . . . .	750	750	750	750	750	750	750	750	750
And at 750¢ per ton of wagon	750	825	900	1 000	1 100	1 225	1 350	1 500	1 650
Total charges for the 1st or 2nd terminal service of clerkage performed by the West Eastern Railway Company . . . . .	1 500	1 575	1 650	1 750	1 850	1 975	2 100	2 250	2 400
Total charges for the 1st and 2nd terminal services of clerkage performed by the South Northern and the West Eastern Railway Companies, conjointly	3 000	3 150	3 300	3 500	3 700	3 950	4 200	4 500	4 800



## EASTERN RAILWAY COMPANIES CONJOINED

—Charges for the first and second terminal services of clearance

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$	$1\frac{1}{4}$	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{9}{16}$	$3\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$2\frac{3}{8}$	$2\frac{5}{8}$	$1\frac{9}{16}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{9}{16}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{4}$	I
$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$
I	I	I	I	I	I	I	I	I	I	I	I	I	I
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{8}$	$3\frac{1}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$5\frac{1}{8}$	$5\frac{3}{8}$	$6\frac{1}{8}$	$6\frac{3}{8}$	$7\frac{1}{8}$	$8\frac{1}{8}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{5}{8}$	$4\frac{1}{8}$	$4\frac{3}{8}$	$4\frac{5}{8}$	$5\frac{1}{8}$	$5\frac{3}{8}$	$6\frac{1}{8}$	$6\frac{3}{8}$	$7\frac{1}{8}$	$7\frac{3}{8}$	$8\frac{1}{8}$	$9\frac{1}{8}$
Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.	Per ton of load d.
$\frac{750}{1800}$	$\frac{750}{1975}$	$\frac{750}{2175}$	$\frac{750}{2400}$	$\frac{750}{2650}$	$\frac{750}{2925}$	$\frac{750}{3225}$	$\frac{750}{3550}$	$\frac{750}{3900}$	$\frac{750}{4275}$	$\frac{750}{4700}$	$\frac{750}{5150}$	$\frac{750}{5625}$	$\frac{750}{6125}$
2 550	2 725	2 925	3 150	3 400	3 675	3 975	4 300	4 650	5 025	5 450	5 900	6 375	6 875
$\frac{750}{1800}$	$\frac{750}{1975}$	$\frac{750}{2175}$	$\frac{750}{2400}$	$\frac{750}{2650}$	$\frac{750}{2925}$	$\frac{750}{3225}$	$\frac{750}{3550}$	$\frac{750}{3900}$	$\frac{750}{4275}$	$\frac{750}{4700}$	$\frac{750}{5150}$	$\frac{750}{5625}$	$\frac{750}{6125}$
2 550	2 725	2 925	3 150	3 400	3 675	3 975	4 300	4 650	5 025	5 450	5 900	6 375	6 875
$\frac{750}{1800}$	$\frac{750}{1975}$	$\frac{750}{2175}$	$\frac{750}{2400}$	$\frac{750}{2650}$	$\frac{750}{2925}$	$\frac{750}{3225}$	$\frac{750}{3550}$	$\frac{750}{3900}$	$\frac{750}{4275}$	$\frac{750}{4700}$	$\frac{750}{5150}$	$\frac{750}{5625}$	$\frac{750}{6125}$
5 100	5 450	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900	11 800	12 750	13 750

## EXAMPLE 54

THE SOUTH NORTHERN AND WEST EASTERN

*General merchandise carried in open and*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
<b>A2.</b> Distinguishing weights of loads . . . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
<b>B2</b> Distinguishing weights of loads . . . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads . . .	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons . . . . .	1	1.00	1.00	1.00	1.00	1.00	1.00	2	2.00
Totals . . . . .	2	2.00	2.00	2.00	2.00	2.00	2.00	3	3.00
Charges for risk undertaken by the South Northern Railway Company, computed at 180¢ per ton of load	180	180	180	180	180	180	180	180	180
And at 120¢ per ton of wagon . . . . .	120	132	144	160	176	196	216	240	264
Total charges for risk undertaken by the South Northern Railway Company . . . . .	300	312	324	340	356	376	396	420	444
Charges for risk undertaken by the West Eastern Railway Company, computed at 180¢ per ton of load	180	180	180	180	180	180	180	180	180
And at 120¢ per ton of wagon . . . . .	120	132	144	160	176	196	216	240	264
Total charges for risk undertaken by the West Eastern Railway Company . . . . .	300	312	324	340	356	376	396	420	444
Total charges for risk undertaken by the South Northern and the West Eastern Railway Companies, conjointly . . . . .	600	624	648	680	712	752	792	840	888

RAILWAY COMPANIES, CONJOINED  
in covered wagons—Charges for risk

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1½	1	—
7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	7½	—
3½	3½	2½	2½	2½	2½	1½	1½	1½	1½	1½	1½	1	1
8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½	8½
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2½	2½	2½	3½	3½	3½	4½	4½	5½	5½	6½	6½	7½	8½
3½	3½	3½	4½	4½	4½	5½	5½	6½	6½	7½	7½	8½	9½
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
180	180	180	180	180	180	180	180	180	180	180	180	180	180
288	316	348	384	424	468	516	568	624	684	752	824	900	980
468	496	528	564	604	648	696	748	804	864	932	1 004	1 080	1 160
180	180	180	180	180	180	180	180	180	180	180	180	180	180
288	316	348	384	424	468	516	568	624	684	752	824	900	980
468	496	528	564	604	648	696	748	804	864	932	1 004	1 080	1 160
936	992	1 056	1 128	1 208	1 296	1 392	1 496	1 608	1 728	1 864	2 008	2 160	2 320

## EXAMPLE 55

THE SOUTH NORTHERN AND WEST EASTERN

*General merchandise carried in open and*

NOS OF GRADES	9	10	11	12	13	14	15	16	17
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2 Distinguishing weights of loads . . . . . (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
Average weights of wagons (5 tons + 2½ tons for empties)	7½	7½	7½	7½	7½	7½	7½	7½	7½
B2 Distinguishing weights of loads . . . . . (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
Average weights of wagons (5½ tons + 2½ tons for empties)	—	8½	8½	8½	8½	8½	8½	8½	8½
Unit-weights of loads . . . . .	1	1	1	1	1	1	1	1	1
Proportionate weights of wagons	1	1½	1½	1½	1½	1½	1½	2	2½
Totals	2	2½	2½	2½	2½	2½	2½	3	3½
Charges for extraneous services performed by the South Northern Railway Company, computed at 060¢ per ton of load . . . . .	060	060	060	060	060	060	060	060	060
And at 060¢ per ton of wagon . . . . .	060	066	072	080	088	098	108	120	132
Total charges for extraneous services performed by the South Northern Railway Company . . . . .	120	126	132	140	148	158	168	180	192
Charges for extraneous services performed by the West Eastern Railway Company, computed at 060¢ per ton of load . . . . .	060	060	060	060	060	060	060	060	060
And at 060¢ per ton of wagon . . . . .	060	066	072	080	088	098	108	120	132
Total charges for extraneous services performed by the West Eastern Railway Company . . . . .	120	126	132	140	148	158	168	180	192
Total charges for extraneous services performed by the South Northern and the West Eastern Railway Companies, conjointly	240	252	264	280	296	316	336	360	384

## RAILWAY COMPANIES CONJOINED

*in covered wagons—Charges for extraneous services*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$3\frac{1}{8}$	$2\frac{1}{10}$	$2\frac{1}{5}$	$2\frac{3}{8}$	$2\frac{3}{10}$	$1\frac{1}{10}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{5}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{10}$	1	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{9}{10}$	$3\frac{1}{5}$	$2\frac{1}{10}$	$2\frac{3}{8}$	$2\frac{3}{10}$	$2\frac{9}{10}$	$1\frac{1}{10}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{9}{10}$	$1\frac{1}{4}$	$1\frac{1}{3}$	$1\frac{1}{10}$	1
$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{10}$	$2\frac{1}{10}$	$2\frac{3}{10}$	$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{9}{10}$	$4\frac{9}{10}$	$4\frac{9}{10}$	$5\frac{9}{10}$	$5\frac{9}{10}$	$6\frac{9}{10}$	$6\frac{9}{10}$	$7\frac{5}{10}$	$8\frac{5}{10}$
$3\frac{1}{10}$	$3\frac{1}{10}$	$3\frac{7}{10}$	$4\frac{1}{10}$	$4\frac{1}{10}$	$4\frac{7}{10}$	$5\frac{1}{10}$	$5\frac{9}{10}$	$6\frac{1}{10}$	$6\frac{1}{10}$	$7\frac{9}{10}$	$7\frac{9}{10}$	$8\frac{5}{10}$	$9\frac{5}{10}$
Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>	Per ton of load <i>d</i>
060	060	060	060	060	060	060	060	060	060	060	060	060	060
144	158	174	192	212	234	258	284	312	342	376	412	450	490
204	218	234	252	272	294	318	344	372	402	436	472	510	550
060	060	060	060	060	060	060	060	060	060	060	060	060	060
144	158	174	192	212	234	258	284	312	342	376	412	450	490
204	218	234	252	272	294	318	344	372	402	436	472	510	550
408	436	468	504	544	588	636	688	744	804	872	944	1 020	1 100

The first and second terminal services of truckage relating to loads and wagons.

The first and second interjunctional services of truckage relating to loads and wagons.

The junctional services of truckage relating to loads and wagons.

But, under the conditions presumed, each railway company renders, on its own system, the following services of truckage :—

The interterminal service of truckage relating to the instruments of power.

That part of any service of stoppage which consists of truckage relating to the instruments of power.

A complete list of charges, per ton of load, stated in pence and fractions of a penny for terminal, interjunctional, and junctional services, liabilities, and obligations, applicable to general merchandise, conveyed between stations on the South Northern Railway and stations on the West Eastern Railway in open and in covered wagons provided by either of the two Railway Companies, is given in Example 56, the first of the three Examples immediately following. Reference to the No. of Example whence the charges have been taken is entered opposite the name of each description of service, liability, and obligation.

In Example 57, numbered scales of rates, per ton of load, stated in pence and fractions of a penny, agreeing with those employed in Example 11, except that the grades extend from Nos 9 to 31 instead of from Nos. 7 to 29, are entered opposite the consecutive distances to which they refer. The initial distance on the South Northern Railway, to which the first scale of rates refers, is one mile, and the consecutive distances are multiples of one mile, extending from 1 to 200 miles, as before. The rate of progression is increased, after 15 miles, from one to two miles, and, after 65 miles, from two to three miles. The initial distance on the West Eastern Railway, to which the first scale of rates refers, is fifteen-sixteenths of a mile, and the consecutive distances are multiples of that fraction, extending from fifteen-sixteenths of a mile to  $187\frac{8}{16}$  miles. The rate of progression is increased, after  $14\frac{1}{16}$  miles, from fifteen-sixteenths of a mile to  $1\frac{1}{8}$  miles, and after  $60\frac{1}{8}$  miles, from  $1\frac{1}{8}$  miles to  $2\frac{1}{2}$  miles. At the head of the respective columns are entered the total charges, per ton of load, stated in pence and fractions of a penny, for terminal, interjunctional, and junctional services, liabilities, and obligations, taken from Example 56.

Example 58 constitutes a complete Table (Table IX) of Rates and Charges, per ton of load, for general merchandise forming the first and second divisions of traffic, when conveyed by the South Northern and the West Eastern Railway Companies conjointly. It is prepared by adding together the rates and charges contained in Example 57 to

form scales of united rates and charges, per ton of load, stated in shillings and pence, together with the consecutive distances, on each railway to which they refer. These distances extend from 1 to 200 miles on the South Northern Railway, and from  $\frac{1}{16}$ ths of a mile to  $187\frac{1}{2}$  miles on the West Eastern Railway. Fractions of a penny are disposed of—those under a halfpenny being disregarded, and those amounting to a halfpenny and over being treated as pence.

Joined with the rates and charges, per ton of load, by means of which they have been calculated, are entered the amounts, per distinguishing weight of load, printed in italics, due for distances of 15, 65, 140, and 200 miles on the South Northern Railway, and  $14\frac{1}{16}$ ,  $60\frac{5}{16}$ ,  $131\frac{4}{16}$ , and  $187\frac{8}{16}$  miles on the West Eastern Railway, respectively. When Tables of Rates and Charges are established for practical use, the amounts, per distinguishing weight of load, due for each consecutive distance, should be calculated and entered so as to form a part of the contents of the Tables, in the manner shown in the Example.

The amounts chargeable for the transport of consignments of merchandise that are less than full loads, and whose weights come between the weights of loads distinguishing adjoining grades, must be calculated by means of the higher rates and charges applicable to the lesser weights of loads, unless, by so doing, the amounts yielded exceed the amounts calculated by means of the lower rates and charges applied to the greater weights of loads. The insertion, in each Table, of amounts, per distinguishing weight of load, due for each consecutive distance, in proximity to the rates and charges, per ton of load, will tend to prevent clerks from entering wrong amounts in invoices when the circumstances are as described, and will also save the labour of calculation with regard to consignments that are full loads or less than full loads, whose weights correspond with the weights of loads employed to distinguish the grades.

Inasmuch as the ratio of the weight of empty wagons to the weight of loaded wagons, apart from the loads, conveyed one mile, is greater when general merchandise is conveyed by two railway companies, conjointly, than when conveyed by one railway company, owing to restrictive rules governing the return of wagons to the owning company, loads of all magnitudes require to be advanced in grade in order that higher rates and charges occasioned by greater proportionate weights of wagons to unit-weights of loads may suitably apply. By increasing the weights of wagons by one-half instead of one-quarter, to include the conveyance of empties, the weights of loads remaining unaltered, the weights of loads employed to distinguish grades 7 to 29 in Table I, Example 12, are required to distinguish grades 9 to 31 in Table IX, Example 58, marking an advance of two grades for all magnitudes of loads furnished

General merchandise carried in open and in covered wagons—Complete list of charges

NOS OF GRADES		9	10	11	12	13	14	15	16	17
		Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
A2.	Distinguishing weights of loads (1)	7½	6½	6½	5½	5½	4½	4½	3½	3½
	Average weights of wagons . . .	5	5	5	5	5	5	5	5	5
	Add one-half of weights of wagons, to include the weight of empty wagons conveyed . . .	2½	2½	2½	2½	2½	2½	2½	2½	2½
	Total weights of wagons . . .	7½	7½	7½	7½	7½	7½	7½	7½	7½
B2	Distinguishing weights of loads (2)	—	7½	6½	6½	5½	5½	4½	4½	3½
	Average weights of wagons . . .	—	5½	5½	5½	5½	5½	5½	5½	5½
	Add one-half of weights of wagons, to include the weight of empty wagons conveyed . . .	—	2½	2½	2½	2½	2½	2½	2½	2½
	Total weights of wagons . . .	—	8½	8½	8½	8½	8½	8½	8½	8½
	Unit-weights of loads . . .	1	1	1	1	1	1	1	1	1
	Proportionate weights of wagons . . .	1	1½	1½	1½	1½	1½	1½	2	2½
	Totals . . .	2	2½	2½	2½	2½	2½	2½	3	3½
Ref to the Nos. of Examples		Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d	Per ton of load d
44	Charges for the 1st and 2nd terminal services of stoppage, including taxes . . .	4 960	5 208	5 456	5 787	6 117	6 531	6 944	7 440	7 936
45	Charges for the 1st and 2nd terminal services of haulage, including taxes . . .	1 450	1 520	1 590	1 683	1 777	1 893	2 010	2 150	2 290
46	Charges for the 1st and 2nd terminal services of haulage . . .	2 900	3 040	3 180	3 367	3 553	3 787	4 020	4 300	4 580
47	Charges for the 1st and 2nd terminal services of truckage . . .	2 900	3 040	3 180	3 367	3 553	3 787	4 020	4 300	4 580
48	Charges for the 1st and 2nd interjunctional services of stoppage, including taxes . . .	4 960	5 208	5 456	5 787	6 117	6 531	6 944	7 440	7 936
	Charges for the 1st and 2nd interjunctional services of haulage, including taxes . . .	300	315	330	350	370	395	420	450	480
49	Charges for the 1st and 2nd interjunctional services of haulage . . .	600	630	660	700	740	790	840	900	960
	Charges for the 1st and 2nd interjunctional services of truckage . . .	600	630	660	700	740	790	840	900	960
50	Charges for the four junctional services of stoppage, including taxes . . .	992	1 042	1 091	1 157	1 224	1 306	1 389	1 488	1 587
	Charges for the junctional service of haulage, including taxes . . .	060	063	066	070	074	079	084	090	096
51	Charges for the junctional service of haulage . . .	120	126	132	140	148	158	168	180	192
	Charges for the junctional service of truckage . . .	120	126	132	140	148	158	168	180	192
52	Charges for the 1st and 2nd terminal services of porterage . . .	8 000	8 200	8 400	8 666	8 932	9 266	9 600	10 000	10 400
53	Charges for the 1st and 2nd terminal services of clerkage . . .	3 000	3 150	3 300	3 500	3 700	3 950	4 200	4 500	4 800
54	Charges for risk . . .	600	624	648	680	712	752	792	840	888
55	Charges for extraneous services . . .	240	252	264	280	296	316	336	360	384
	Total charges for terminal, interjunctional, and junctional services, liabilities, and obligations . . .	31 802	33 174	34 545	36 374	38 201	40 489	42 775	45 518	48 261



## EASTERN RAILWAY COMPANIES CONJOINED

*for terminal, interjunctural, and junctional services, liabilities, and obligations*

18	19	20	21	22	23	24	25	26	27	28	29	30	31
Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	—
5	5	5	5	5	5	5	5	5	5	5	5	5	—
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	—
$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	$7\frac{1}{2}$	—
$3\frac{1}{2}$	$3\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{1}{2}$	1
$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$	$5\frac{1}{2}$
$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$	$2\frac{3}{4}$
$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$	$8\frac{1}{4}$
1	1	1	1	1	1	1	1	1	1	1	1	1	1
$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{1}{2}$
$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$	$3\frac{1}{2}$
Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load	Per ton of load
d	d	d	d	d	d	d	d	d	d	d	d	d	d
8 432	9 011	9 672	10 416	11 243	12 152	13 144	14 219	15 376	16 616	18 021	19 509	21 080	22 733
2 430	2 593	2 780	2 990	3 223	3 480	3 760	4 063	4 390	4 740	5 137	5 557	6 000	6 467
4 860	5 187	5 560	5 980	6 447	6 960	7 520	8 127	8 780	9 480	10 273	11 113	12 000	12 933
4 860	5 187	5 560	5 980	6 447	6 960	7 520	8 127	8 780	9 480	10 273	11 113	12 000	12 933
8 432	9 011	9 672	10 416	11 243	12 152	13 144	14 219	15 376	16 616	18 021	19 509	21 080	22 733
510	545	585	630	680	735	795	860	930	1 005	1 090	1 180	1 275	1 375
1 020	1 090	1 170	1 260	1 360	1 470	1 590	1 720	1 860	2 010	2 180	2 360	2 550	2 750
1 020	1 090	1 170	1 260	1 360	1 470	1 590	1 720	1 860	2 010	2 180	2 360	2 550	2 750
1 686	1 802	1 934	2 083	2 249	2 430	2 629	2 844	3 075	3 323	3 604	3 902	4 216	4 547
102	109	117	126	136	147	159	172	186	201	218	236	255	275
204	218	234	252	272	294	318	344	372	402	436	472	510	550
204	218	234	252	272	294	318	344	372	402	436	472	510	550
10 800	11 266	11 800	12 400	13 066	13 800	14 600	15 466	16 400	17 400	18 532	19 732	21 000	22 332
5 100	5 450	5 850	6 300	6 800	7 350	7 950	8 600	9 300	10 050	10 900	11 800	12 750	13 750
936	992	1 056	1 128	1 208	1 296	1 392	1 496	1 608	1 728	1 864	2 008	2 160	2 320
408	436	468	504	544	588	636	688	744	804	872	944	1 020	1 100
51 004	54 205	57 862	61 977	66 550	71 578	77 065	83 000	89 400	96 265	103 600	111 400	119 700	128 500